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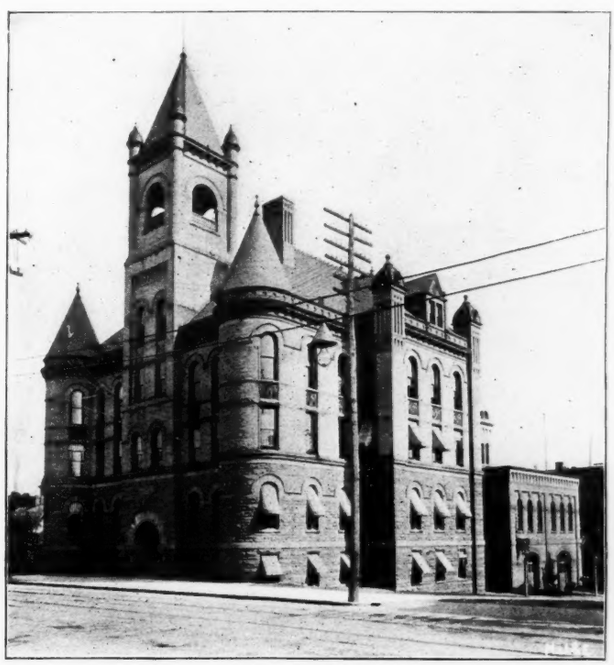
THE LEAGUE OF AMERICAN MUNICIPALITIES

Fifth Annual Convention to Be Held at Jamestown, Next Door to the Pan-American—David B. Hill, Tom L. Johnson, Samuel M. Jones and Other Notabilities to Be Present—Public Ownership of Public Utilities, Uniform Municipal Accounting and Great Civic Problems to Be Discussed

THE next meeting of the League of American Municipalities will be the largest and most helpful in the history of the organization. Already more delegates have applied for accommodation than have been in attendance at any previous session, and still applications are being received. It will be the most helpful because it has the best programme that has yet been presented for discussion. Perplexing problems which bother the progressive city official will receive attention, and there will be an opportunity of meeting a larger number of bright city officials—the up-to-date fellows who make things move in their respective bailiwicks—than has ever been afforded by previous gatherings of this or other civic organizations. The city official who remains at home thinking that he will get it all in the report will miss the best of the meeting. While the published proceedings will contain a verbatim report of all papers and discussions, and will, therefore, be valuable, the spirit of the meeting will be missing, and it will be impossible to convey, in the page, the enthusiasm of the gathering and the hundred and one ideas which may be gained by personal contact with the delegates. For these reasons, the wise and progressive city official will permit no trivial excuse or obstacle to keep him from attending this convention.



JAMESTOWN CITY HALL

OBJECTS OF THE LEAGUE

The constitution declares that the object of this organization "shall be the general improvement and facilitation of every branch of municipal administration by the following means: First, the perpetuation of the organization as an agency for the co-operation of American cities in the practical study of all questions pertaining to municipal administration; Second, the holding of annual conventions for the discussion of contemporaneous municipal affairs; Third, the establishment and maintenance of a central bureau of information for the collection, compilation and dissemination of statistics, reports and all kinds of information relative to municipal government."

THOSE WHO ARE ELIGIBLE TO MEMBERSHIP

"The memberships of this League," says the constitution, "shall consist of active and associate members. Any municipality in the United States or Canada may become an active member of this organization. Any person who has held any municipal office in the United States or Canada may become an associate member of this association upon the filing of a written application with the secretary, and the approval of the same by the executive committee.

"There shall be no initiation fee and each and every municipality becoming a member of this organization shall pay annual dues, as follows: Cities under 10,000 population, $10; between 10,000 and 25,000, $20; between 25,000 and 50,000, $30; between 50,000 and 100,000, $40; between 100,000 and $200,000, $50; over 200,000, $60. The annual dues of associate members shall be $5 per annum."

RAPID GROWTH OF THE LEAGUE

The League was organized in 1897, at Columbus, O., by an enthusiastic gathering of city officials who were called together from all parts of the United States and Canada by the founder of this journal, which was then called *City Government*. Nearly every State was represented and a well-ordered programme was carried out. Hon. Samuel L. Black—then Mayor of Columbus—was elected first president.

The next meeting was held at Detroit, with greater success. But the "junketing" element at this and the next year's meeting, at Syracuse, retarded the growth and diminished the usefulness of the organization quite seriously, so that the convention at Charleston, S. C., last December, was not so well attended as the first and second. But here, under the favoring influence of the more serious element, a reorganization was effected which was particularly hostile to the "junketing" phase of the movement. For this reason, the programme committee has devoted only one afternoon and evening to the interests of the small minority which is always and only on

pleasure bent. And, furthermore, a large portion of this afternoon set aside for pleasure seeking will be spent in inspecting the municipal features of Jamestown. About fifty cities have been added to the membership list during the past seven months, which speaks well for the present management.

THE OFFICIAL PROGRAMME

The preliminary programme appeared in the July issue of THE MUNICIPAL JOURNAL AND ENGINEER, which promised much, but the official programme, just sent out by Secretary MacVicar, is still better. A glance at it will be sufficient to attract the attention of the wideawake city official and will be the only needed argument to convince him of the importance of being present.

Wednesday, August 21—10 a. m.

Address of Welcome, Hon. J. Emil Johnson, Mayor of Jamestown.

Response and President's Address, Hon. J. A. Johnson, Mayor of Fargo, N. D.

Reports of committees and officers.

2 p. m.

Municipal Lodging Houses, Hon. James K. McGuire, Mayor of Syracuse.

Special Assessments for City Work, James L. Weeks, Esq., City Attorney, Jamestown.

The Contract System for City Work, Mr. S. F. Crabbe, City Engineer, Fargo, N. D.

8 p. m.

Political Liberty, Hon. Samuel M. Jones, of Toledo.

The Unsatisfactory Condition of Garbage Disposal in the United States, Mr. M. N. Baker, Associate Editor, *Engineering News,* New York City.

Discussion, led by Dr. William De Lano, of the Health Department, Grand Rapids, Mich.

Thursday, August 22—9:30 a. m.

The Proposed Ohio Municipal Code, Hon. Edward Kibler, Newark, O.

The Value of Municipal Leagues, Mr. William S. Crandall, Editor, MUNICIPAL JOURNAL AND ENGINEER, New York City.

Municipal Restrictions on Vice, the Rev. Norman Fox, D. D., Mayor of Morristown, N. J.

The Canadian Municipalities, Hon. John Arbuthnot, Mayor of Winnipeg, Manitoba, Canada.

2 p. m.

The Municipalities of the Great Northwest, Hon. A. A. Ames, Mayor of Minneapolis, Minn.

The Cost and Durability of Brick Pavements in Ithaca, Prof. C. L. Crandall, Cornell University, Ithaca, N. Y.

The Development of Bituminous Pavements; Embracing the Use of Coal Tar and Asphalt in Street Work, Mr. Fred J. Warren, Boston.

8 p. m.

Low Fares as the Best Method of Remunerating Cities for Franchise Rights, Hon. Tom L. Johnson, Mayor of Cleveland.

Steel and Concrete in Municipal Construction, illustrated with stereopticon views, Mr. Merrill Watson, New York City.

Friday, August 23—9:30 a. m.

A City's Experience with Water Works Promoters, Hon. Geo. R. Perry, Mayor of Grand Rapids, Mich.

Municipal Taxation, Hon. Lawson Purdy, Secretary New York Tax Reform Association, New York City.

Practical Application of Uniform Accounting to City Comptrollers' Reports, Mr. Harvey S. Chase, C. P. A., Boston.

Local Self-Government for Cities, Prof. Frank Parsons, Boston.

Discussion, led by Hon. James M. Head, Mayor of Nashville, Tenn.

Friday Afternoon and Evening.

Inspection of municipal and other features.

Saturday, August 24—9:30 a. m.

Public Ownership of Public Utilities, Hon. Lee Meriwether, St. Louis.

Discussion, led by Hon. J. W. Riggins, Mayor of Waco, Tex.

Election of officers and selection of next convention city.

OFFICERS OF THE LEAGUE

1. J. A. Johnson, President
2. Chas. S. Ashley, First Vice-President
3. J. Adger Smyth, Second Vice-President
4. M. M. Stevens, Third Vice-President
5. John MacVicar, Secretary
6. Thomas P. Taylor, Treasurer

ENTERTAINMENT FEATURES

Both the officials and citizens of Jamestown are at work, trying to anticipate every need of their expected guests. The principal features of the pleasure side of the convention have been arranged for. Much to the regret of Jamestown, the authorities of the League, in their anxiety to eliminate the "junketing" spirit, have only set aside an afternoon and an evening for sightseeing. This means that a large amount of pleasure must be crowded into a small space of time.

A public reception, tendered by the officials and citizens of the city, will be given on Wednesday evening. On the following Friday, trolley rides, a visit to the principal industries—municipal and manu-

NEW SHERMAN HOUSE—HEADQUARTERS OF LEAGUE

facturing—of the city, to be followed by a ride on the world famous Chautauqua Lake, with a stop at the Assembly, which will then be in session, is a part of the programme. Refreshments, of course, will be provided and, in the evening, the guests will be taken to the summer theatre at Celoron, one of the leading resorts on the lake.

MUNICIPAL AND INDUSTRIAL EXHIBITS

There is a fine auditorium in the City Hall, large enough to accommodate the sessions of the League, and, in view of this fact, it has been arranged to have the large corridors—and some of the rooms opening on these—of the first and second floors, given up to the municipal exhibits. An effort has been made to make the exhibit one of the attractive features of this convention. Most of the space has already been taken, and the opportunity of inspecting many of the appliances and supplies which are used in the construction and maintenance of a city is assured.

Besides this, there will be an industrial exhibit held in the large auditorium at Celoron, where the principal products of the many manufactories of Jamestown will be arranged for the special inspection of visitors.

TRANSPORTATION AND HOTELS

Secretary MacVicar authorizes the statement that the Pan-American rates to Buffalo, from all points, are the best that can be had and that, therefore, special convention rates have been abandoned. For those who live at a distance it will be better to purchase tickets direct to Buffalo, as that city is only sixty-nine miles from Jamestown, to which point the Chautauqua tourist rates prevail.

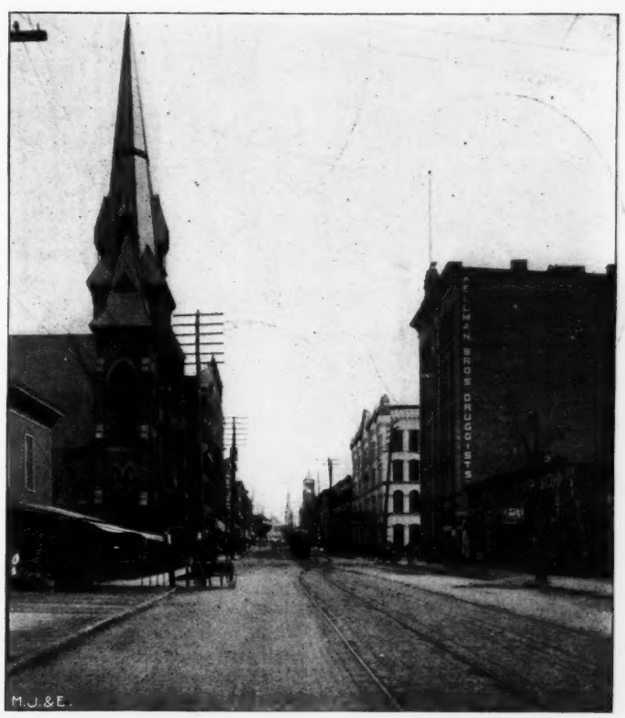
The Erie railway offers the following rates: From Chicago to Buffalo—ten-day tickets, $13; fifteen-day tickets, $16; thirty-day tickets, $21. An extra charge of $2.50 will be made for a sleeper to Jamestown.

From Cincinnati to Buffalo—Ten-day tickets, $12.25; fifteen-day tickets, $15; tickets limited to October 31st, $16.35. An extra charge of $2 will be made for a sleeper to Jamestown.

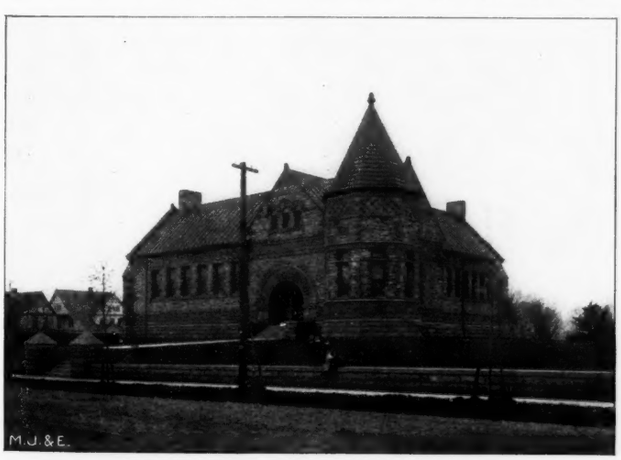
From St. Paul and Minneapolis to Buffalo, *via* the C. M. & St. P. and the Erie—$24.50 for ten days from Buffalo, after date of issue; $31.35 from Buffalo, fifteenth day after date of issue; $38.30 from Buffalo, thirty days after date of issue. At present and until October 31st, sleeping car rates from the Twin cities to Chicago are $2.

A proportionate rate will be charged from intermediate points and equally advantageous points. It would be wise to make inquiry about rates over given routes several days prior to your start. If any further particulars are required, address Hon. John MacVicar, Des Moines, Iowa.

The New Sherman Hotel has been selected as official headquarters, where every delegate is expected to register and receive his badge immediately upon his arrival. The rates at the New Sherman are from $2 to $3.50 per day, on the American plan. There are other hotels in Jamestown, at which guests will be accommodated at the same or lower rates. Any one wishing to engage rooms in advance should communicate with the chairman of the committee on hotels, Mr. M. R. Stevenson.



JAMESTOWN—THIRD STREET, LOOKING EAST



JAMES PRENDERGAST FREE LIBRARY—JAMESTOWN

THE MANY ATTRACTIONS OF JAMESTOWN

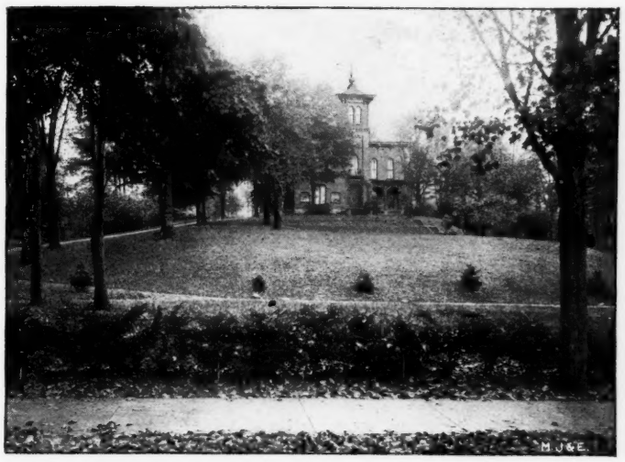
The city of Jamestown, while it has many beautiful features in itself, enjoys a large amount of reflected glory from the Chautauqua Lake Assembly, the mother of all the Chautauqua summer schools in this and foreign lands. While this well-known intellectual summer resort has made Chautauqua Lake and Jamestown famous, yet it must not be forgotten that it was the exceptionally rare conditions, scenic and otherwise, surrounding this charming city among the hills of Western New York, which first attracted the attention of the founder of the Chautauqua Assembly. The city official who looks for the first time upon the beauties of Jamestown and the limpid lake, placidly resting in the hollow of the mountain top, will long to return to this region for his next summer vacation, as tens of thousands have returned year after year to recreate and enjoy themselves.

THE FOUNDING OF THE CITY

The city was settled over one hundred years ago, the site having

MAYOR JOHNSON AND HIS CABINET

1. The Mayor
2. B. D. Phillips, Pres. Common Council
3. E. B. Crissey, Pres. Board of Public Works
4. F. A. Fuller, Jr., Pres. Board of Education
5. Edward Appleyard, Pres. Board of Health
6. J. B. Shaw, City Treasurer
7. J. L. Weeks, City Attorney
8. F. W. Dalrymple, City Engineer
9. H. W. Walker, Street Commissioner
10. C. B. Jones, City Clerk
11. C. A. Okerlind, City Accountant
12. F. H. Wilson, Chief of Fire Department
13. F. A. Johnson, Chief of Police
14. Abner Hazeltine, Police Justice
15. W. L. Ransom, Secretary to the Mayor



FORMER RESIDENCE OF EX-GOVERNOR FENTON

been selected by James Prendergast. It has passed through the vicissitudes common to most enterprising towns, and has survived both fire and flood. But from every trying experience its energetic and aspiring citizenship has come to the rescue and the consequence has been, that while there have been temporary setbacks, Jamestown has made steady and sure progress. New York's "War Governor," Reuben E. Fenton, was an honored citizen of Jamestown.

The fact is not generally known that the late Judge Richard P. Marvin, of Jamestown, was the father of the project for building the "Old Erie" railroad. But the first railroad to reach the city was the Atlantic & Great Western, which was ultimately absorbed by the Erie system. The first train arrived on August 23, 1860, just thirty-one years previous to the meeting of the League. Then the town was a village and contained, comparatively, a handful of houses and a few places of business.

Sixteen years ago the enterprising citizens of the town applied to the State Legislature for a city charter and obtained it. Since that date the growth of the city has been more rapid. The prosperity

JAMESTOWN Y. M. C. A. BUILDING

of Jamestown during this brief period has been something phenomenal. From a town, almost unknown to large maufacturing interests, it has risen to occupy the first position in the State, when measured by the number of people who are employed in factories, per thousand population. At present there are nearly 150 factories in the city, the largest one of which employs 786 persons, and the total force of the factories aggregating about 6,000.

In the sixteen years of civic life there have been but four mayors, including the present incumbent, Hon. J. Emil Johnson, who was elected last year. The first was Hon. Oscar F. Price, who served four successive terms. After an interval of one term, which was filled by Hon. Eleazer Green, Mr. Price was chosen for a fifth term by practically a unanimous vote. Hon. Henry H. Cooper, who is at present the Sheriff of Chautauqua county, served one term.

THE JAMESTOWN OF TO-DAY

The city is lighted by a municipal plant that supplies arc and incandescent lamps for the streets, alleys and public buildings, at the simple cost of production; it also provides a commercial service which competes with an excellent private plant.

JAMESTOWN CLUB

Street railways girdle the city and traverse the leading streets, extending east and west, bringing into close touch the villages of Falconer, Celoron and Lakewood, the whole constituting a service that compares favorably with any system in the State.

The railroad facilities consist of the Erie road for all points east and west; the Buffalo and Southwestern, running direct between Jamestown and Buffalo; the Jamestown and Chautauqua road, connecting at Mayville with the Pennsylvania system; and the Dunkirk, Alleghany Valley and Pittsburg, which is a part of the Central system and affords quick and easy communication with all parts of the country.

Although one of the smaller cities of the State, it has well paved streets, a good sewer system, an excellent park system, a street cleaning department second only in efficiency to that of New York, a fine water supply, which is operated by a private company, besides all other conveniences common to the modern city. The fire and police departments are fully equipped and well administered. The public buildings speak well for the citizenship of the city and display a thriftiness seldom found in larger municipalities.

The affairs of the city are conducted in an economical manner and a business-like way, and, in some respects, can be pointed to as a model. Little need be said about the municipal features, for the opportunity will be afforded to all visitors to go through the various departments and examine the methods which have been employed to make the city so successful.

LARGEST STREET LIGHTING PLANT IN MASSACHUSETTS

A Well Managed Plant—Compared With Other Cities of the Bay State—Better and Cheaper Service Than That of Private Companies—No Good Reason Why Other Cities Cannot Do as Well

By Alton D. Adams

MEASURED by its output to electric street lamps, the municipal plant at Peabody is the largest in Massachusetts. Peabody is a town of 11,523 inhabitants, and enjoys the advantage of electrical street lighting at a cost of one-half of the average contract rate for places of its population. During the year ending June 30, 1900, the average daily number of electric arc street lamps supplied by the municipal plant at Peabody was 182, and the average daily number of incandescent lamps seventeen. The nominal candle-power of each of the arc lamps was 1,200, and each of the incandescent lamps was rated at thirty-two candle-power. All of these street lamps operated ten hours per night, and on an average 30.4 nights per month. It follows that the number of hours of operation for the year were $10 \times 30.4 \times 12 = 3,648$ for each lamp. As there were 182 arc lamps in use the total arc-lamp-hours amounted to $3,648 \times 182 = 663,936$. In like manner the hours burned during the year by each incandescent lamp were 3,648, and the number of these lamps being seventeen, the total service from incandescent lamps was $3,648 \times 17 = 62,016$ lamp-hours.

METHOD OF CORRECT COMPARISON

If a single kind and candle-power of electric lamp was used in all places, it would only be necessary to determine the charge or cost to each town or city for one hour of service from this lamp, in order to make fair comparisons of the cost of light in different places. As a matter of fact, both arc and incandescent lamps are frequently used in a single town, as above, and in different towns arc and incandescent lamps of various candle-powers are employed.

No satisfactory comparison can be made between arc and incandescent lamps as to their nominal candle-powers, because, while the rating of incandescent lamps is substantially correct when the lamps are new, the actual candle-powers of arc lamps are a mere fraction of their usual ratings. Moreover, the same amount of energy does not produce equal illumination when consumed in arc or in incandescent lamps. The amount of work or energy that either an arc or incandescent lamp of any nominal candle-power should consume per hour is quite accurately known. It follows that the only satisfactory way to compare the prices for service in arc and incandescent lamps is on the basis of the energy that each consumes per hour, measured in electrical units. The ordinary unit of electrical energy being known as the kilowatt-hour, the hourly consumption of each lamp in terms of this unit should be determined in order to make comparisons.

CONSUMPTION PER CANDLE-POWER

A usual and fair figure for the consumption of energy by incandescent lamps is 0.0035 kilowatt-hour for each nominal candle-power, per hour, that the lamp operates. The corresponding figure for arc lamps is 0.00025 kilowatt-hour per nominal candle-power for each hour of lamp service. As the arc lamps at Peabody were each of 1,200 nominal candle-power, the energy consumed by one of these lamps during an hour of operation is $0.00025 \times 1,200 = 0.300$ kilowatt-hour. Each of the thirty-two candle-power incandescent lamps consumes during one hour of operation $0.0035 \times 32 = 0.112$ kilowatt-hour.

The 1,200-candle-power arc lamps at Peabody operated a total of 663,936 lamp-hours during the year, as shown above, so that they consumed energy to the amount of $663,936 \times 0.3 = 199,180.8$ kilowatt-hours. The incandescent lamps operated a total of 62,016 lamp-hours, and therefore consumed $62,016 \times 0.112 = 6,945.8$ kilowatt-hours of energy.

With these figures for lamp consumption, the municipal plant at Peabody supplied 202,126.6 kilowatt-hours of energy to its arc and incandescent street lamps during the year ending June 30, 1900. This output for electric street lamps is not only the largest by any municipal plant in the State, but is more than two and one-half times as great as the amount of electrical energy purchased for street lamps from a private corporation by any town or city in the commonwealth of less than 12,000 population. From this it is fair to conclude that the people of Peabody appreciate well lighted streets, especially when the cost of the service per lamp hour is far below that in most other places of the same population.

THE PLANT AND ITS EQUIPMENT

The municipal electric plant at Peabody was started for street lamps in 1892, and extended its service to private consumers in 1893. No other public electrical supply exists in the town, but the Salem Gas Light Company distributes gas at a net price of $1.20 per 1,000 cubic feet. The average candle-power of this gas is 17.6, according to the report of the State inspector, for the year 1900. The generating equipment at the Peabody plant includes three steam engines, with a total rated capacity of 475 horse-power, seven dynamos having capacities for 242 arc lamps of 1,200-candle-power each, and 2,000 incandescent lamps of sixteen candles each; also, the necessary boilers and auxiliary apparatus. The outside construction for this plant extends over 135,000 feet of streets, and includes 320 poles and 457,464 feet of wire. Besides the service to street lamps, the municipal plant supplied 5,500 incandescent lamps of sixteen-candle-power each, and three arc lamps of 1,200 nominal candles on the premises of private consumers, during the year ending June 30, 1900.

THE TOTAL INVESTMENT

By the town in the plant up to the end of the year just named was $82,348, or about 1 per cent. of the valuation of the town's estates, which was $8,578,349.

For service to commercial incandescent lamps the maximum municipal rates are 13 cents per kilowatt-hour. Electrical energy for power sells at 10 cents per kilowatt-hour. Commercial arc lamps are charged for at the rate of $70 per year for service six days per week until 11 p. m. All of these rates are subject to a discount of 5 per cent. for payment in fifteen days, and to a discount of one-third on bills of more than $30 per quarter. This total discount of 38 1-3 per cent. on bills over $30 per quarter reduces the charge per kilowatt-hour for energy used in incandescent lamps, which comprise nearly all of the commercial service, to 8.01 cents per kilowatt-hour, a price much below the average for similar service from private electric corporations in places of the same population throughout the State. It is thus evident that whatever favorable results have been reached at Peabody as to the low cost of street lighting have not been due to excessive charges to private consumers. During the year ending June 30, 1900,

THE MONEY INCOME

of the municipal electric plant at Peabody, from the sale of energy for light and power, was $6,922.95, and from other sources $80.20. For this same year the value of the light supplied to public buildings was $940. The sum of these three items is $7,943.15, which represents the entire earnings of the plant, aside from its service in street lighting.

The total expense of management and operation for the municipal plant during the above year was $15,882.25. This expense includes all supplies for operation, labor, repairs, insurance, law expenses and bad debts. Interest computed on the total investment in this plant at the rate paid on the municipal bonds and notes amounts to $3,081.39. Depreciation at 5 per cent. on the entire cost of the equipment reaches the sum of $2,836.59, and other items of expense not enumerated were $79.25. The sum of the operating expenses, interest on plant investment, depreciation and the minor items last named is $21,879.48, which represents all charges to be made against the municipal plant for the year, in order to determine the entire cost of service from it. As shown above, the value of all service performed by the municipal plant during the year in question, except the street lighting, was $7,943.15. The charge remaining against the

street lighting is therefore $13,936.33. Dividing this last sum by the number representing the total kilowatt-hours of energy delivered to street lamps during the year, that is, by 206,126.6, as stated above, the resulting rate of cost for this energy is 6.7 cents per kilowatt hour.

As the 1,200 candle-power arc lamp consumes energy to the amount of 0.3 kilowatt-hour per hour, the cost of operation for this lamp by the Peabody plant is $6.7 \times 0.3 = 2.01$ cents per hour. Each thirty-two-candle incandescent lamp consumes 0.112 kilowatt-hour per hour, and costs, therefore, $6.7 \times 0.112 = 0.75$ cents per lamp-hour.

COMPARISON WITH OTHER CITIES

For comparison with this cost, the prices paid for energy used in electric street lamps by all other towns and cities of about the same population in the State may be taken. The population of Peabody, according to the census of 1900, was 11,523, as mentioned above. Those places in the State that buy their electric street lighting from private corporations, and have each a population between 11,000 and 12,000, are as follows: Adams, population, 11,134; Attleborough, 11,335; Framingham, 11,302; Plymouth, 11,547; and Weymouth, 11,324. In order to determine the true average price paid for electric energy consumed by street lamps in these places, the total price paid for all of the energy is divided by the number of kilowatt-hours this energy represents, as in the case of Peabody. The figures for the kilowatt-hours supplied to arc and incandescent street lamps in each place for the year ending June 30, 1900, and the entire sum paid for this energy, follow:

	Kilowatt-hours in street lamps.	Price paid per kilowatt-hour, cents.	Cost of a 1,200 candle-power arc lamp per hour at this price, cents.	Amounts paid for this energy.
Adams	55,814.4	8.95	2.68	$4,998
Attleborough	34,340.8	16.21	4.86	5,571
Framingham	60,462.2	13.68	4.10	8,278
Plymouth	36,336.3	15.16	4.55	5,500
Weymouth	52,591.6	13.18	3.95	6,934
Totals	239,545.3	....	...	$31,281

Dividing the $31,281 by the number 239,545.3, representing the total kilowatt-hours for which this sum was paid, shows the true average price per kilowatt-hour to be 13 cents, or almost double the rate of cost for similar service from the municipal plant at Peabody. This price of 13 cents per kilowatt-hour is equivalent to a charge of $13 \times 0.3 = 3.9$ cents for a 1,200 candle-power arc lamp per hour, and to a charge of $13 \times 0.112 = 1.45$ cents for a thirty-two-candle-power incandescent lamp per hour.

BENEFITS TO TAXPAYER AND CONSUMER

While the taxpayers of Peabody thus enjoy a great advantage over those in other towns of the same population in the matter of rates for electric street lamps, the private consumers there are supplied with electrical energy at a rate materially below the average in the other five towns. As shown above, the rate at Peabody for energy used in private incandescent lamps is 13 cents less 5 per cent., or 12.35 cents per kilowatt-hour, for bills of less than $30 per quarter, and 8.01 cents per kilowatt-hour for bills of larger amount. At Adams the commercial rate for energy used in incandescent lamps is 13.33 cents per kilowatt-hour, and no discount is stated. In Attleborough the regular charge for energy consumed by incandescent lamps is 25 cents per kilowatt-hour, with a discount of 20 per cent. where bills are for more than sixteen kilowatt-hours per month, making the net price on large bills 20 cents per kilowatt-hour. Contract rates without meters are the rule in Framingham, where the charge is $1 for a sixteen-candle-power incandescent lamp used until midnight, and $2 for those used all night, per month. Allowing ten hours for the average time of all night service, and fifty-six kilowatts for the average rate of energy consumption in sixteen-candle-power incandescent lamps, these contract rates are equivalent to a charge of 11.96 cents per kilowatt-hour. This is a net rate. Twenty cents per kilowatt-hour is the net rate for service to incandescent lamps at Plymouth. In Weymouth the commercial rate for incandescent lamps is also 20 cents per kilowatt-hour, and no discount is stated. Unfortunately, figures showing the total sales of energy at these rates are not at hand, so that the true average rate for the five places, which would be found by the division of the total sum paid in all of the towns by the number representing the kilowatt-hours sold, cannot be computed. The best that can be done, therefore, is to find the rough average rate for the five places by dividing the sum of their rates by five. Taking the lowest or net rate in each case, this sum of rates is 85.29, and the average for the five places 17.06 cents per kilowatt-hour. With the higher rates for small consumers, the corresponding sum is 90.20, and the average rate is 18.06 cents per kilowatt-hour. Comparing these rates with the charges to private consumers at Peabody, which are 12.35 cents for small bills and 8.01 cents for large bills per kilowatt-hour, the average rate in the five towns is about 50 per cent. greater for small consumers, and more than 100 per cent. greater for large users than are the rates in force at Peabody.

LOCAL CONDITIONS COMPARED

It may be suggested that some special favorable conditions exist at Peabody for the development and distribution of electrical energy, and it is well to determine whether such is the fact. The use of efficient equipment at the generating plant, and the skillful employment of labor are matters of good management in which the municipal and the private electric plants have equal opportunities, so that no inquiry is needed in these matters.

The costs of distribution, on the other hand, depend to a large extent on factors beyond the power of good management to change. The total length of streets along which pole lines must be erected and the length of wires that must be run, in order to operate street lamps and serve private consumers, determine to a considerable extent the investment, interest, depreciation, repairs and the labor of distribution in each plant, and these factors, while fairly constant, may vary greatly from the average in some particular case. In order to compare the private plants in the five towns with the municipal plant at Peabody as to the distribution systems, the following figures for each town are given. The averages are obtained in each case by a division of the totals for all of the places by their number, five:

	Number of poles	Length of streets with wires.	Length of wires.
Adams	210	46,200	179,022
Attleborough	479	136,387	307,194
Framingham	1,549	242,880	713,109
Plymouth	526	68,672	252,720
Weymouth	1,286	201,558	582,143
Totals	4,040	695,687	2,034,188
Averages	808	133,137	406,837

As previously noted, the corresponding figures for Peabody are: Number of poles, 320; length of streets over which wires are run, 135,000 feet; total length of wires, 457,645 feet. It thus appears that, while the municipal plant has not erected as many poles as have the five private plants on an average in both the length of streets over which wires are run and in the total length of wires put up, the municipal plant exceeds the averages of the others. It is not thus unfair to the private plants to conclude that, as to difficulties of distribution, the plant at Peabody is in no better situation than are the five private plants. The very large variations, shown for the number of poles erected by the several plants is probably due to a common practice by which space for electric light wires is rented on the poles of telephone and telegraph companies.

In view of all the facts available, there seems to be no good reason why municipal plants in the five places named might not attain results similar to those reached at Peabody. The figures in this paper are derived largely by computation from the report of the Massachusetts Board of Gas and Electric Light Commissioners for the year ending December 31, 1900.

MUNICIPAL OWNERSHIP OF PUBLIC UTILITIES

Claims for Public Ownership Antagonistic—So-Called Utopian Conditions Do Not Exist in European Cities—Politics the Bane of American Civil Rule—Merit, Not "Pull," the Standard Across the Water—The Remedy is Regulation, Not Ownership—A Warning Sounded

By Walter S. Allen

In the current discussion of the municipal ownership of gas works, electric light plants and street railways, the advocates of this idea assert positively, that the public management of these needs in a modern community will result in reduced cost of service to the users and profits to the municipality, which will reduce the burden of taxation on all the citizens, while those who consider that there may be some question as to the probable advantages to accrue to the community are looked upon as enemies to the common welfare and tools of the corporation.

It is my intention here to consider these two propositions from the standpoint of one who believes that better service at lower rates can be obtained from private companies properly controlled by public authority, and to point out the principles which ought to govern the methods of control.

REASONS FOR PUBLIC OWNERSHIP ANTAGONISTIC

A little consideration of the two claims made in favor of the public ownership of public utilities will show that these reasons are by the very nature of things antagonistic to one another, that if the price of service be reduced to its lowest possible limit; that is, to cost, there will be no profits to relieve taxes, or if profits are secured these must be paid by the users and the price of service must remain at a high level.

Let us suppose, for the sake of argument, that prices for service are maintained at a level which will return a net profit to the city, after charging off depreciation on the plant and interest on the loans, and consider from whom this profit comes and who benefits by it.

The municipality receives a return which it may apply to general purposes, and the city is, by this amount, so much better off; but who contributes this? It is plain that profits must come from the pockets of consumers of light or users of street railways, and thus the profits of the municipal operation of these public utilities becomes a special form of taxation laid upon the users. These must pay an increased price for light or for street transportation in order to reduce the taxes of those who are unable to avail themselves of these services or who have no opportunity to do so. In other words, taxes instead of being equal and proportional, or even based on ability to pay, are assessed according to the use made of these modern improvements, and since those who do so use them make up a very small part of the community and are also in many instances those who can least well afford to pay, a charge for service in excess of actual cost causes them to bear an unjust proportion of the expenses of the administration of the municipality.

FOR THE SAKE OF ILLUSTRATION

Let us take the not improbable case where there are but ten private users of electric light from a municipal plant in a community of 10,000 inhabitants, and the price charged to these ten users for lighting their stores and houses is sufficiently high to pay all the expenses of operation. If the city uses for lighting its streets fifty arc lamps, the city will then get its street lighting free of cost, but ten users of electric light pay for all the street lighting for the community, and the high charge laid on them becomes a special tax for the benefit of the remainder of the inhabitants.

The results obtained in cities in Great Britain and Germany under municipal management are freely quoted by the supporters of the plan for extending the functions of municipalities, but these advocates fail to state that in all these cities a charge is made by the gas or electric light department for all the street lighting, and that taxes and water and work done by any other department of the city are charged up to the gas and electric light departments in the same way they would be charged to a private company.

Moreover, and this is important, they omit to call attention to the fact that in those cities where profits, in the most part made by charging full commercial prices for street lighting, are used to reduce taxes, the price for service to private uses is higher than in those places where profits are applied to the reduction of the price to consumers.

HIGH PRICES IN ENGLISH CITIES

We hear a great deal about the low price of gas and electric light in Glasgow and about the large profits made by the municipality in Manchester and Birmingham, but we do not have shown to us that the price of service in Glasgow is such that the profits of the gas business were, last year, thirty-three pounds and the electric light profits thirty-nine pounds, while the price of gas and electric light in Manchester was higher than in Glasgow, although the conditions in the latter place are such that the prices ought to be considerably lower.

A great deal is written about the low price of gas in Birmingham, Manchester and Glasgow, municipalities supplying their own gas, but nothing is said of the price in Sheffield, Newcastle and Plymouth supplied by companies working under conditions similar to those in the former cities. All these furnish gas at lower rates and give as good or better service. It is invariably the rule that companies introduce modern improvements far more rapidly than do municipalities, and this is proper, for managers have no right to risk public funds in schemes of uncertain value.

Much stress has been laid on the application of the profits from municipal management of public utilities to reduce the general rate of taxation. Does anyone seriously believe that if such profits were really made the general taxpayer would learn of the fact from his tax bills? Our city councils can always find opportunities to spend money, and they would look on these profits as so much more income in addition to the amount received from taxes. It may even be questionable whether a municipality has a right, under the state constitutions, to charge such prices for service as will return a profit, for this profit would be a special tax laid upon a small portion of the community for the benefit of the others and would not be equal and proportional. No court has as yet passed upon this question.

If the price of service is to be reduced, the cost of production, which must include taxes and interest on the cost of the plant, must be lowered. Is it possible that anybody who has ever had any experience with general municipal methods believes that municipalities can do work more cheaply than companies?

THE CITY'S CHIEF ADVANTAGE

The chief advantage which a city has over a company lies in its ability to borrow money at a lower rate of interest than a company, because the security for the loan consists of the whole property of every individual in the community, but this advantage is not as great as may seem. If we analyze the accounts of any public service company we will find that this saving will amount to between 5 and 10 per cent. of the income, an amount easily offset by the enhanced cost of municipal methods of work. I am sure that no one who sees city workmen at work on the streets and compares them with workmen doing similar work for a street railway company can fail to see that the latter accomplish far more in a given time.

Statements are freely made concerning the success of municipal plants in Europe, and on these assertions are based the claim that similar results may be obtained in this country. But there are great and fundamental differences between municipal government in the United States and Europe. If a European city desires a manager for some municipal plant it advertises for such a man and hunts all over the country until one is found, who, by his ability, is considered fit to hold the position, and neither residence, personal relations nor political "pull" play any part in the choice. This highly developed non-political civil service extends also to the subordinates and workmen. In Germany the desire for highly trained civil servants goes even further, and the cities there advertise for a mayor when the

position becomes vacant, and as the usual term of office of these officials is twelve years the cities secure trained ability which contrasts very strongly with the usual American officials.

MERIT, NOT "PULL," GOES IN EUROPEAN CITIES

In the same way there is a great difference in the composition of the city councils in Europe. In England the restrictions on municipal suffrage and the inclusion of women taxpayers as municipal voters make the councils far more representative of the taxpayers than in this country, and in Germany the restrictions are still greater. There a group of taxpayers, each of whom pays more than a certain sum in taxes, chooses one-third of the council, a group paying between certain fixed limits chooses another third, and the rest of the people choose the remainder. In Berlin, for instance, there are about 4,000 voters of the first class, 8,000 of the second and 120,000 of the third, and each of these classes elect one-third of the council.

What the public desires from these public servants is good service at a low cost, and the cry for municipal ownership fostered by one or another interest has induced the belief that only in this way is it possible to secure these.

REGULATION, NOT OWNERSHIP, THE WAY

The true method of reducing the price of public services to the user is not by increasing the work of the municipalities, but by the regulation on equitable principles of the price of service supplied by companies. Let private enterprise risk the money necessary for the introduction of new methods and allow it a fair return on the capital invested; require it to keep its books of account according to methods prescribed by the State or the city; have these books open to the inspection of public officers; allow no issues of stock or bonds for any other purpose than the extension of the plant; prohibit the making of these extensions from profits and arrange that economies due to improvements in methods and ability of management be divided between the users and those who have invested their money in the development of the business.

Most of the profits made by the companies are due to good management, and while a portion belongs to the community as a return for the right to use the streets, another portion rightfully belongs to the company as compensation for ability of management. By this division there will always be an inducement to increase the service and to cheapen it to the users, because from greater use there will come greater profits to the company.

THE ONLY FAIR TREATMENT OF THE QUESTION

Under the conditions enumerated above we can secure fair treatment to those who put their money into these plants at considerable risk and at the same time secure to the users low rates for service. The public will obtain its light or street car service at a lower price than is possible from a municipal plant; the evils always present when a city undertakes a commercial enterprise will be reduced to a minimum, and it will be impossible for a company to maintain excessive prices for service.

The extent to which municipalities have already gone in the way of bonding the taxpayers of this and future generations for public works of all kinds is beginning to excite apprehension in the minds of careful and conservative observers, but with true American disregard of the future such criticisms do not receive any attention from the mass of our citizens. We are content to live in the present, and those who suggest that our cities should be financiered in a conservative way are attacked as old fogies and told that progressive communities must have all the modern improvements, and that future generations may safely be left to devise means for paying off the debts incurred by this generation for public improvements.

THE ADMINISTRATION OF A SOUTHERN CITY

THAT the city of Savannah, Georgia, is prosperous and progressive is apparent from the last annual report, which contains a complete documentary history. From the year 1789, when Savannah became a municipality, up to the present date, the city has steadily advanced and at no time more so than within the last twenty years. The crudities of the first years had somewhat disappeared by the dawn of the nineteenth century. The city had grown in wealth and influence, but there were few public improvements. The water came from wells in the public squares. There were no public lights. The commons were made the receptacles of garbage and waste. Paving was unknown and there was no police protection. But all these things have changed and at present the city compares favorably with others of the same population.

At the beginning of the century the sanitary conditions were bad. In 1804 a Board of Health was established and a rigid quarantine instituted against the introduction of smallpox and yellow fever, but despite all precautions epidemics occurred, that of 1854 carrying off over 1,000 of the inhabitants. It was not until about 1895, after the extensive works of drainage were established, that the public health was reasonably secure.

One of the greatest factors in the improvement of the health of city was the introduction of the artesian water to the exclusion of the river and well water. The failure of the wells to provide an adequate amount for the city rendered necessary the building of water works to use the river water, but an inspection by competent engineers showed that plenty of water could be secured if the wells were sunk deep enough. This was at last done, and the water supply is now pure and abundant. The city uses an average of 5,842,654 gallons a day, at a yearly expense of $33,482.11. The expense of installing the water works has been considerable, owing to the many changes in plans, the entire cost amounting to over a million dollars.

Last year the city paid five cents a square yard to repair its asphalt and seven-tenths of a cent for the brick. The city pays one-third of the cost of street paving, and the cost of street intersections. If a street car company is using a street it pays for paving between its tracks and two feet on either side. To clean the streets it cost $12,782.41, at the rate of .0409 per square yard for asphalt and .0229 per square yard of brick. Savannah is one of the cities that builds her own sidewalks, and, in 1900, these cost $21,341.19. The public grounds of the city amount to $186.52 acres and for their maintenance, $8,000 was appropriated.

The school system of Savannah has grown steadily and at present there are nine white and four negro schools in the city. The number of white scholars in 1900 was 4,048, taught by 94 teachers. The schools of the county are under the supervision of the city superintendent, and here there are twelve schools for whites with sixteen teachers and 657 scholars, and twenty-seven for colored with twenty-seven teachers and 1,693 pupils. The total amount spent on education last year was $135,443.30.

The fire department consists of five companies with a total force of eighty-five men. It costs $73,474.55 to maintain it in its present efficient condition. That it is efficient is evident from the fact that the fire loss last year was lower than it has ever been.

The police force is made up of about eighty men, which is sufficient to keep order in the city. The cost to the city is more than would appear necessary, as last year it took nearly $90,000 to maintain it.

Attempts have been made to establish a municipal lighting plant, but the project has never been accomplished. A private company now supplies the city with 505 lights at the rate of $6.00 a month per light.

In 1889 experiments were made with crematories to dispose of the garbage and waste, but after ten years they were abandoned and the garbage was dumped beyond the city limits. The crematories are now considered worthless, and it is doubtful if any further use will be made of them. They were built originally at a cost of $10,870, and $6,000 has been appropriated for their yearly expenses.

The total expenditures for 1900 amounted to $876,746.17. Some of the expenses, other than those already given, were as follows: Health department, $20,974.87; city lamps, $36,318.98; opening streets, $35,869.80; parks and squares, $7,916.22; paving streets, $33,564.28; salaries of the officials, $36,813.44.

The total amount of revenue that the city received last year was $876,746.17, coming from various sources. The sum assessed upon real property, valued at $13,108,067, was $538,067.11, making the rather low rate of $1.45 on a hundred dollars. The remainder of the revenue comes from taxes on personal property, fees, ground, market and water rents, and the tax on the sale of liquor.

FIRE-PROOFING METHODS FOR BUILDINGS

PART II

Types of New Systems—Cement Concrete Used for Generations in Europe—Good, Light, Economical American Fire-Proofing Methods—Expanded Metal an Important Factor—Principal Types Described—Simple, But Expert Engineers Secure Better Results

By J. W. Howard, B. L., C. E

ANOTHER method of using long detached fire-proof tiles between the floor beams is shown in Fig. 11. This is suitable for only the lightest constructions, such as private houses. The blocks would be too heavy if made for deep beams of large buildings. The system of Fig. 11 is a modified construction of what was previously shown in Fig. 4 in July issue. The end pieces, or skew-backs, are the same in both. The single center pieces are substituted for several blocks. The system of Fig. 11 is for thin floors only, with beams about six inches deep and spaced thirty inches or less apart. The rods with tightening nuts are needed every few feet between the beams to keep

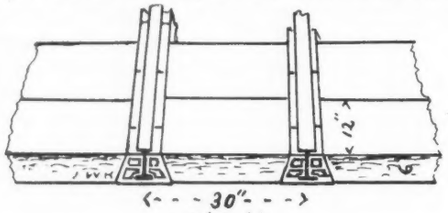


FIG. 11.

the beams from spreading from the thrust of the wedge shaped blocks of this flat arch, as well as all block construction. Such rods pass between the blocks or through them.

PLASTER OF PARIS USED

The following is a very light construction for fire-proofing floors, which do not have to support weights upon the fire-proofing between the floor beams, and is a system much used on the continent in Europe and a little in the United States. It consists in introducing composition planks or slabs between the beams. These are called plaster boards. They are very light and can be cut with a saw and edge tools to any shapes needed. Plaster boards are made at factories or works by laying ordinary dry meadow or similar reeds lengthwise in oiled moulds and pouring semi-liquid plaster of paris

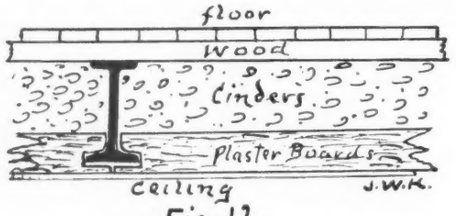


Fig. 12.

in the moulds to the depth desired. When the plaster has set, which it does in an hour, the plaster boards of various width, thicknesses and lengths are dried in hot drying rooms. There are many other uses for plaster boards than for fire-proofing, which, however, is their principal appplication. They are taken to the building where needed and if not previously cut are there sawed and placed in position, as shown in Fig. 12. They are adapted to protecting wooden floor beams, etc., in semi-fire-proof building, as shown in Fig. 13.

Slabs and plates of other materials are in use with varying success; but careful attention must be paid to their strength, durability, fire-proof quality, adaptibility to the construction in view, before they are adopted in each building proposed.

CEMENT CONCRETE FIRE-PROOFING

Having briefly described the principal types, using detached pieces in the shapes of hollow blocks, tiles, slabs, etc., I will now indicate several excellent kinds of fire-proof floors of concrete supported or strengthened in various ways. Hydraulic cements, especially Portland or equivalent cements, and plaster of paris combined in various ways with sand, crushed stone, or similar material, or with other substances, have been used for successful fire-proof building for several generations, if not centuries, in Europe. Under the general name of cement concrete we are just beginning to use the experience of Europe in the buildings of the United States; not in the system of architecture, but the use of cement in making floors and other parts of buildings.

No general method is more economical nor more efficient than concrete. It provides strong, light weight fire-proof floors, partitions, etc. It can be adapted to the largest and smallest buildings. Three things are needed to secure reliable concrete floors; a good cement, a good workman, and a good system. Competition between the concrete systems themselves and as a whole against hollow blocks and tiles has done more to improve, and at the same time reduce the cost of fire-proofing, than anything else. It is only the conservatism of the building departments of a few cities, not to mention the strong influence of money directly or indirectly supplied by makers of old local systems, which prevents the use of other excellent systems, recognized as efficient and economical in all cities of Europe and a few in America; systems, which, when extensively used in our country, will make our warehouses, offices, and houses safer at little cost.

CONCRETE FIRE-PROOFING STRENGTHENED BY IRON

Concrete fire-proof construction is generally strengthened by the use of iron of special shapes embedded in it. The lines of compres-

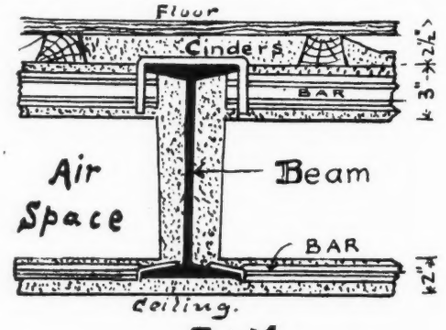


FIG. 14.

sion and tension are carefully considered. When used in curved arches compression only appears, which concrete sustains admirably. In flat arches, which, when solid become technically beams, much of the concrete in the lower half is in tension and is strengthened by having some form of iron held within it in such a way as not to slip in the concrete.

Long and careful experiments for strengthening concrete arches, flat pieces, beams, etc., have been made for many years by the ablest engineers, especially in France, Austria, and England, and within

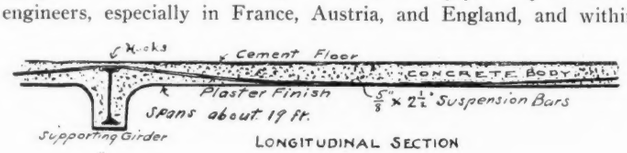
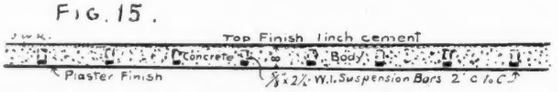


FIG. 15.



about twenty years, in the United States. It is now an established fact that cement concrete monoliths of many forms, shapes, and sizes, for numerous purposes, are available, especially for fire-proof construction.

THE PRINCIPAL TYPES—THE COLUMBIAN

Several systems, as types, will be indicated and without intention

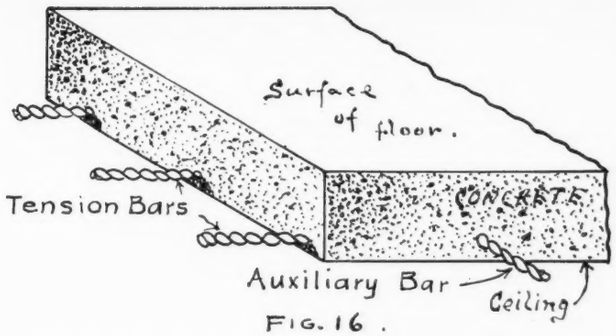


FIG. 16.

of showing comparative values. The question of cost, locality, time of construction, purpose, size, and speed of erection of building are as important as other considerations.

The Columbian system of fire-proofing is indicated by Fig. 14. A few words of description will suffice. Bent pieces of iron are laid over the top of the floor beams. These bent supports, or stirrups, have slotted holes in them into which the two iron bars are slipped. These bars extend between the beams and have two or four flanges, or projections, on each to better support the concrete which is laid with the bars embedded in it. The bars are of different sizes and spaced two feet, or less, apart according to the weight of floor and load to be supported. A flat, temporary center or support of planks is placed below. Upon this the concrete is put in position and held until hard. The method of fire-proofing beams, ceilings, etc., by this and other systems will be described later under their proper head-

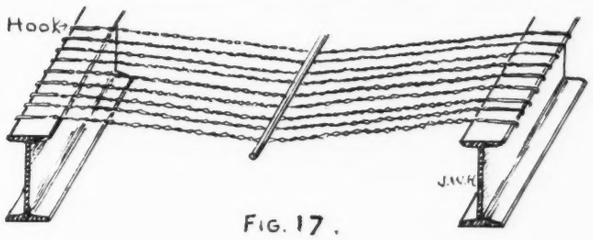


FIG. 17.

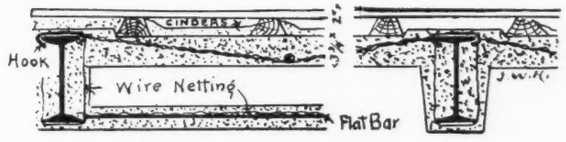


FIG. 18.

ings. The Columbian system has many interesting points and can be adapted to all kinds of buildings, even the smallest and simplest. In common with several other light concrete floors it reduces the cost of a building because, being of light weight and vertical pressure only, lighter steel columns, girders, and beams are required in the whole building. No tie rods are needed, as there is no thrust. Holes for pipes can be cut where desired; an important matter which some systems permit without weakening the work and others do not. This system can be adapted to semi-fire-proof floors with wooden floor beams, especially when air space is left and the ceilings below properly protected by one of several methods described later. For warehouses and floors subject to heavy blows this system is valuable.

THE WILSON

The Wilson floor is shown in Fig. 15. Bars laid flat are hooked

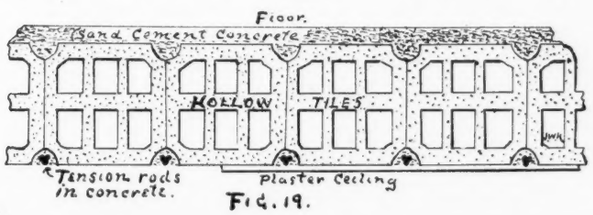


FIG. 19.

over the top of the floor beams. They are about two and one-half inches by five-eighths of an inch in size, and are spaced two feet or less apart, according to strength desired. They droop or curve down along the approximate line of tension in the finished concrete monolith of the finished floor. Forms of planks are put in place below while the concrete is being laid between, over and around the suspended rods and beams as shown. When all is solid the forms are removed. Such a floor, if of good materials properly put together, is very light and strong. It seems to have come into prominence in Philadelphia. It must be so well laid that the rods will not slip in the concrete, otherwise the principles of a mathematical beam supported at its ends would be lost.

THE RANSOM

The Ransom floor is one in which the tension bars are twisted, as shown in Fig. 16. Because thus twisted they cannot pull through the concrete. Many successful floors have been thus made. Some have

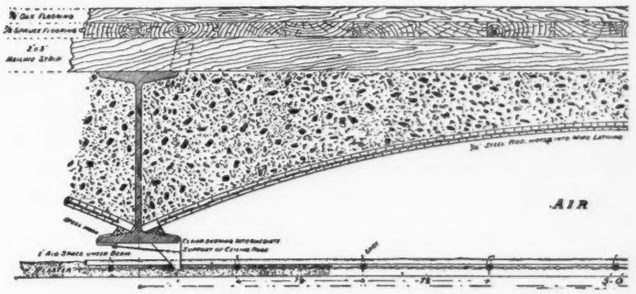


FIG. 20.

been made with concrete instead of iron beams and even without girders. The monolith of concrete with the twisted bars in its under part extends between walls, beams, girders or otherwise as desired up to spans even as great as twenty, and special cases thirty feet. A lighter construction is where the concrete is omitted between the twisted bars, making panels below the floor or in the ceiling of the room below. Good workmanship has been used in this system, and has done as much to make it a success as anything else. The methods of arranging the twisted bars are numerous. They can be used similarly to the other rods, etc., in Fig. 15, or to those of Figs. 17, 18, and 19, in which substitutes are used.

Twisted metal, thus embedded in cement, holds, beyond question, to its ultimate breaking strength. Moreover, drawn rods and wire provide iron in its strongest form. Slight twisting makes the iron fibres even stronger than otherwise. Twisted metal enters into several systems.

THE METROPOLITAN

The Metropolitan floor is indicated in Figs. 17 and 18. It consists of wire doubled and twisted and held in place by hooks about an inch apart over the tops of the floor beams. A hollow rod is laid along the center to keep the wires in place during construction. It helps to distribute concentrated loads or blows on the finished floor to several

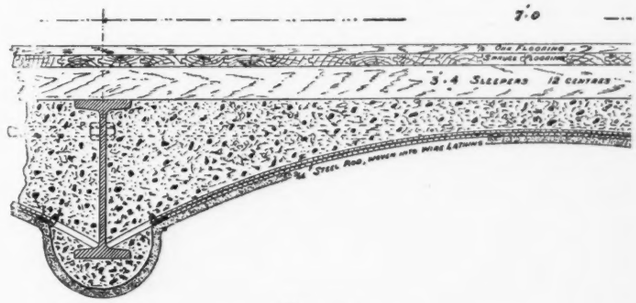
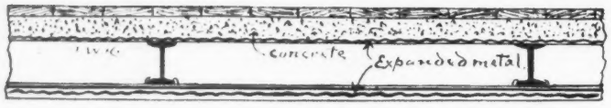
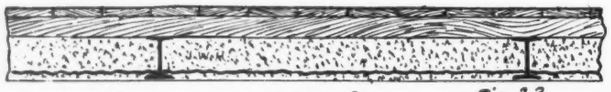


FIG. 21.

wires. In place of Portland cement concrete, the metropolitan system uses principally a mixture of plaster of paris and shavings, or their equivalent, the whole being supported in place by board "centers" below until hardened. This is a very light, rapid, and strong method of making fire-proof floors.



Ventilated floor Fig. 22.



Solid floor Fig. 23.

THE LEE

The Lee floor is not properly a concrete system, but a successful attempt to use hollow tile blocks, combined with the principles of tension rods held in cement. As shown in Fig. 19, the recessed corners of the blocks are used for the round rods twisted in pairs. This construction requires very rigid building walls and a steel floor system. It must be erected with great care, but requires little or no board centers during construction.

THE ROEBLING

The Roebling system is primarily a concrete arch method with strengthening metal below. The general construction is shown in Figs. 20 and 21. Another portion of this system is the use of dense woven wire, called wire lathing, stiffened with steel rods woven in it. This is placed, curve upward, between the beams, as shown in Figs. 20 and 21, where it serves to hold the concrete in place, not only until hardened, but also afterward, as a stiffener imbedded in the concrete. Another application of the wire web or lathing is made by wiring it to straight, small steel bars laid across between the tops of the beams. In this last case the monolith of concrete is flat and of the same thickness throughout, except a little thinner over the beams. The bars and netting in its under side give great strength to it. The result is somewhat similar to the Columbian system, Fig. 14, provided no stirrups were used and a wire netting were fastened to the underside of the bars, the ends of the bars being on the top of the floor beams.

The air spacing and suspended ceilings are generally used with this system, and give additional security against fire, because in case of fire heated air flows away and is renewed by cooler air. The Roebling system is strong and capable of rapid construction without centers or temporary supports.

EXPANDED METAL

The Expanded Metal system is used on principles indicated by the wavy lines in Figs. 22, 23, 24, 25. A light floor above the beams with air space below it is shown in Fig. 22. A solid floor is indicated by Fig. 23. A heavy floor with panels below for warehouses, etc., is shown in Fig. 24. A floor with air space and room for pipes above a suspended ceiling is outlined in Fig. 25.

Fig. 24.

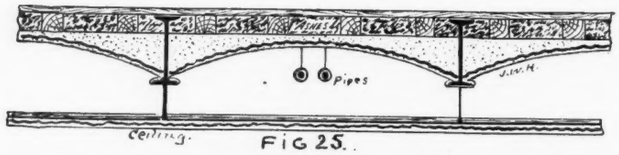


Fig 25.

Expanded metal, being made from sheet steel by special cutting and expanding machines, which twists much of the metal to an angle of 45 degrees from the plane of the metal, holds immovably when imbedded in concrete. This system of strengthening concrete is excellent.

CONCLUSIONS

There are many other systems of strengthened concrete, plaster of paris, and combined systems of concretes and tiles, too numerous to mention; but, as a rule, the simpler systems are the more reliable and economical.

Sufficient has been shown concerning several systems of concrete fire-proof floors to demonstrate that these and others can be relied upon. It is not possible to describe all. But the principles have been indicated by which competent engineers and architects can judge all of this class. Careful and constant supervision is needed to secure good concrete work. Although some patents are involved, it is easily possible to secure materials and construct safe concrete fire-proofing without infringing on patents. But, notwithstanding the simplicity of such fire-proofing, it is better to employ experienced men in order to secure economic and durable results.

(To be continued.)

POPULARITY OF MODERN WOODEN PAVEMENTS

The New Not to Be Confounded With the Old—Used in Europe for More Than Thirty Years—Great Durability and Inexpensive Maintenance—Easily Repaired—Successful Introduction in America

By Frederic Arnold Kummer, C. E., Jun. M. Am. Soc. C. E

The development of wooden pavements in America, in curious contrast to the development of that form of street paving abroad, has been strangely neglected until within a few years. Although wood forms the pavement of nearly all the best streets in English and continental cities, and is used with equally satisfactory results on both residence and heavily traveled streets, its use in this country, up to a recent date, has been so limited as to be hardly worthy of notice, in spite of the fact that most engineers of broader experience regard it as the most satisfactory form of street pavement that can be laid. The writer refers, of course, to scientifically constructed pavements laid with properly treated blocks of suitable and well selected wood, treated so as to be proof against decay, as well as impervious to moisture, and placed on a well constructed concrete foundation. Such pavements have, of course, nothing in common with the attempts, so often made in this country, to construct pavements of round cedar blocks, untreated and without suitable foundation, or with squared blocks, in which the wood without proper seasoning was dipped in a coal tar solution, giving it a surface coating which proved a positive detriment wherever moisture existed in the block, inasmuch as it promptly caused dry or heart rot. Such blocks, laid on plank placed upon the subgrade, were, in the nature of things, doomed to failure from the start, thereby producing a prejudice against wooden pavements in the mind of the average person which still to some, although happily only to a limited extent, exists.

RIGID FOUNDATION INDISPENSABLE

It is, of course, an indispensable condition in all paving construction, that the foundation shall be absolutely rigid. The slightest depression in the foundation, correspondingly affects the paving surface above it, and no matter how durable the paving surface may be, it cannot fail to wear into bad ruts with the greatest rapidity as soon as unequal wear is caused by depressions in the foundation. It was the neglect of proper foundations, coupled with the decay of the wood, which caused the rapid destruction of the squared and round cedar pavements above mentioned.

After securing a proper concrete foundation, say six inches in depth under normal conditions—laid upon a well prepared subgrade—a sand cushion of not to exceed one inch in thickness should be provided to give the blocks a true and elastic bed, taking up any inequalities in the surface of the concrete and providing for any slight variation which may exist in the depth of the blocks.

SUCCESSFULLY LAID IN AMERICAN CITIES

Some excellent examples of this form of pavement may be found

ASPHALT—TREMONT STREET, BOSTON—WOOD

Paved in 1900, with Creo-resinate Wooden Blocks on West Side, Asphalt on East Side

in Indianapolis, Ind., where between two and three hundred thousand yards have been laid within the past six years, all of which has given excellent satisfaction. Some later examples of modern wooden paving may also be found in Boston, where portions of Tremont street are laid with wooden blocks of long leaf Georgia pine, four inches deep, and four inches by eight inches on the wearing surface. These blocks are treated with an extremely high percentage of dead oil of coal tar, commonly known as creosote oil, in combination with formaldehyde and rosin—twenty-two pounds of the mixture per cubic foot being injected—giving absolute penetration throughout the block. The same material, on six inches of concrete, is now being laid on Beacon street, Boylston street, Harvard Bridge, and elsewhere in Boston, and is giving entire satisfaction. An examination of the Tremont street pavement laid last summer shows no wear to date. None could be expected, however, with pavements constructed on such thoroughly scientific lines. The wood must, of course, be of the best quality and carefully selected, and its treatment must be thorough. The addition of the rosin renders the block absolutely impervious to moisture, not only aiding the creosote in preventing decay, but materially hardening the wood.

GREAT ADVANTAGE OF TREATED BLOCKS

One very great advantage of treated blocks over those untreated arises from the fact that in any given number of untreated blocks there would be a slight difference in the density of individual blocks, and therefore a slight difference in the rate of wear; but where blocks are filled with, say the creo-resinate mixture, as was the case in Boston, the more porous blocks take up just that much more of the compound, so that after treatment all the blocks are brought to approximately the same density, and therefore the same wearing quality. Such pavements are, in the writer's opinion, the least slippery of all smooth permanent pavements, and the almost total absence of noise is an advantage which can hardly be overestimated.

In laying the blocks in such work they are laid preferably at an angle of thirty degrees to the curb line, and rammed as close together as possible. By ramming the blocks so closely that practically no joints exists between them, all moisture is excluded from the pavement, and there is no opportunity for frost to act upon it during the winter, nor is there any swelling of the wood, tending to throw the pavement out of grade. Wood is such a poor conductor of heat that although the surface may become hot in the sun, the pavement as a whole does not become sufficiently hot to make any expansion joint necessary. After being thoroughly rolled, the joints are filled with fine sand, and the surface should be treated with a light coat of hot paving cement, or other suitable mixture, to thoroughly fill any cracks or joints which may exist. A final sprinkling with clean sharp sand completes the work. Such pavements are unaffected by heat in summer or the frost in winter. They are sanitary, owing to the antiseptic nature of the ingredients with which every cell is permeated, and they do not become soft and rot in hot weather, nor do they collect and radiate heat, as is noticeably the case with some other forms of pavement.

EASILY REPAIRED

A material advantage found in the case of wooden pavements results from the ease with which repairs can be made. Any number of blocks may be removed, the repair work completed, and the pavement replaced without injury. For this class of work expert labor or special plants are not required.

The blocks treated with rosin in conjunction with creosote have the advantages that not only is the wood made waterproof, but is more dense and of much greater hardness and elasticity. These claims are fully borne out by experience with the pavement. After

LAYING CREO-RESINATE WOODEN BLOCKS ON BEACON STREET, BOSTON

treatment with twenty-two pounds of the mixture to the cubic foot the weight of the block is increased about 50 per cent.

Another advantage claimed for the blocks treated by the creo-resinate process lies in the methods employed for complete sterilization of the timber before the preservative compound is injected. In all treatment of wood this is most important, as otherwise germs of decay existing in the heart of the blocks, and not destroyed by proper sterilization, will develop and cause dry rot, the blocks giving way at the center.

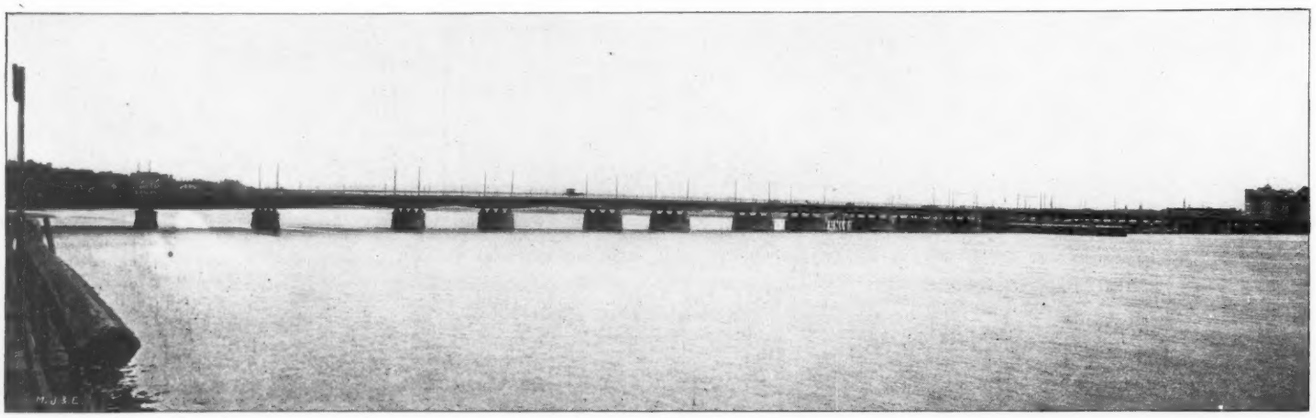
GREAT DURABILITY AND INEXPENSIVE MAINTENANCE

The durability of such pavement is great. Georgia or long leaf yellow pine is a wood having very high resistance to crushing along the direction of its fiber, greater even than oak. With the blocks laid closely, supporting each other laterally, crushing of the wood even under the heaviest loads would be impossible. Surface wear, due to abrasion from the hoofs of horses or the wheels of vehicles, is exceedingly light.

Street.	Date laid.	Cost per yd. for repairs.
Beauchamp Place	Nov., 1882	1/38 of one penny
Brompton Road	Dec., 1878	1/9 " " "
Colville Road and Terrace	May, 1892	3/10 " " "
Earl's Court Road	Oct., 1883	22/57 " " "
Elgin Crescent	June, 1883	5/14 " " "
Gloucester Road	Dec., 1881	1/17 " " "
Holland Park Avenue	Oct., 1882	7/12 " " "
Kensington High Street	May, 1887	4/5 " " "
High Street	Dec., 1878	1 "
Kensington Road	Nov., 1880	1 "

EXCELLENT RESULTS IN FOREIGN CITIES

It is perfectly evident that a class of pavement which has given such excellent results for thirty years abroad; which is laid on some of the most magnificent as well as the most heavily travelled streets in the world, need not, for a moment, be regarded with doubt. It is the pavement of the Champs Elysee, the Place de la Concorde, the Rue de Rivoli (the heaviest travelled street in the world), of the Strand, Piccadilly, Regent street, of Liverpool, of Leeds, Birmingham, Manchester, Brussels, Frankfort, Montreal, of London, which has more than 200,000 miles, and of Paris, the Queen of cities, which has over one and a quarter million square yards. We often speak of insular prejudice, and criticise our foreign cousins for lack of that progressiveness of which, as a nation, we are so justly proud, but the curious form of prejudice which has existed in the direction of street paving improvement has resulted in this well known condition, that the streets of even our finest cities are not to be compared for a moment with those of the great foreign cities. In this particular, at least, we still have much to learn.



HARVARD BRIDGE, BOSTON—SOON TO BE PAVED WITH CREO-RESINATE WOODEN BLOCKS

The average yearly cost per square yard for maintenance as shown from the reports of English and Continental cities is from 1½ to 3 cents per yard—in striking contrast to the cost of maintaining other classes of pavement.

On only one street, Avondale Park, was there any excessive cost for repairs, and this was due to damage to the street by the Telephone Company in laying mains.

Exact figures from the report of the Surveyor of the Parish of St. Mary Abbotts, Kensington, London, for March, 1900, show the cost for repairs on the following ten streets:

WOODEN WATER PIPE ONE HUNDRED YEARS OLD

THE building of the Canal street sewer, a work rendered necessary by the new rapid transit in New York, unearthed some of the old wooden water pipes laid by the Manhattan Water Company in 1801. The pipes were made of pine logs through which a hole was bored with an auger, and were fastened together by having a conical termination on one log that fitted a corresponding cavity on the next. Some of this kind of pipe is still in use in the United States, and it was not so many years ago that London's water was conveyed through pipes of elm wood.

This Manhattan company was a project of Aaron Burr. At the time of its formation, the granting of bank charters was in the hands of the Federalists, who controlled the Legislature of New York State, and Burr knew he could not obtain a bank charter while his enemies were in power, so he conceived the idea of procuring one by stealth.

A scourge of yellow fever had recently visited the city of New York, and its ravages were attributed to the bad water. In this was Burr's opportunity. Therefore a petition was presented to the Legislature for a charter for a company having a capital of $2,000,000 to supply pure water to New York City. The Council of Revision, of which John Jay was president, gave its approval, little suspecting the banking powers concealed, for there was a clause in this charter which authorized the company to use any surplus capital, above the amount needed for the water works, in any money transactions not inconsistent with the Constitution and laws of the State or of the United States.

The company at first obtained permission to use the old reservoir until it was ascertained whether the quality and quantity of water was sufficient for the city. This, however, was soon abandoned and works were established about where Centre and Reade streets now intersect.

The service, of course, was entirely inadequate and many excuses were made by the company for its failure to distribute water. Nor was the water of exceptional quality and those who could afford it preferred to purchase their water from the tea pump in Orange street.

In 1840 the company ceased to be a water company, but has never lost its banking privileges. Nevertheless, in order to retain its charter, water must always be ready for sale and an English wrought iron tank is maintained on Centre street, where a gallon of water will be sold on demand.

BRICK PAVEMENTS IN BUFFALO GROW IN PUBLIC FAVOR

Light Cost for Repairs—No Complaints of Rumbling—Brick Cheaper and More Durable Than Asphalt on Streets With Light Traffic—Stiff Specifications

By Frank V. E. Bardol, C. E

A PAPER on the brick pavements of Buffalo is less interesting than one on asphalt would be, not only because the city has so many more miles of asphalt than of brick, but, also, for the reason that our information upon the durability of asphalt and its suitability for a pavement depends largely upon actual use, while with brick, its suitability can be determined with some degree of certainty before being laid.

The amount of brick pavement in this city compared with asphalt is small, there being of brick, 9.046 miles; asphalt, 223.635 miles.

BRICK PAVEMENTS GROW IN FAVOR

The first brick pavement was laid by the city on Purdy street in 1891. Within the past few years brick has gained in favor. This was brought about by the necessity for repaving a number of asphalt streets. Under the charter, the full cost of the original paving, as well as repaving, is borne by the abutting property. Repairs are a general fund expense. The ordinary taxpayer objects to paying for a pavement the second time, and when he is compelled to, he naturally prefers that material which is not only more durable, but also cheaper, regardless of any other qualities which go to make one material superior to another.

The most prominent street laid with brick in Buffalo is Franklin street in front of the City Hall, paved in 1893 with Franklin brick, manufactured in Franklin, Pa. All the other streets, comparatively speaking, receive light traffic, so that the cost of maintenance of brick cannot be fairly compared with that for asphalt. As a matter of fact the cost for brick repairs up to date has been very light.

The average price this season, based upon the accompanying specifications, including the roadway proper, curbing, grading, tiling and incidentals, with a ten-year guarantee, has been $2.36 per yard. The market price of brick is from $18 to $20 per thousand, laying forty-three bricks to the square yard; broken stone, $1.40 per cubic yard; sand, $1.25 per cubic yard; labor, $1.50 per day for eight hours.

NO RUMBLING SOUND

None of the rumbling complained of in some cities, other than the unavoidable rattle due to the nature of the material, has been experienced here. The precaution we take is to see that the sand cushion is perfectly dry, and at intervals of about 150 feet a sand joint instead of one of grout is made. A sand joint is also made immediately adjoining the curb.

The charter requires that when a street is ordered paved, the Board of Public Works is to advertise for bids on all materials for which specifications have been filed. After the bids are received and referred to the Common Council, it has always been supposed that the taxpayers on the street had the right of petitioning the Council for the kind of material desired. Recently, however, the Court decided that the contract must be awarded to the lowest bidder, and, as heretofore, only one specification for brick has been on file. In the future it will be necessary to prepare separate specifications for the various kinds of brick, such as fire-clay and shale, square edged, round edged, ribbed and grooved, square and round edged, pressed and repressed, end cut and side cut.

The various makes of brick now being bid upon are: All fire-clay—Mack, Porter, Clearfield and Mumm; shale—Preston, Metropolitan and Johnsonburg.

RELATIVE MERITS OF BRICK AND ASPHALT

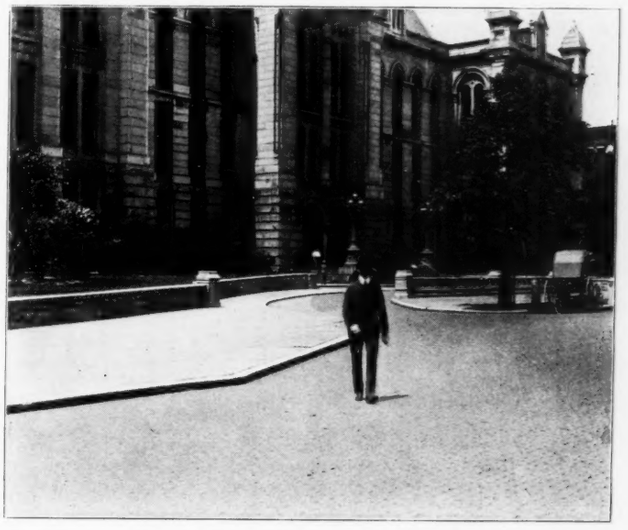
Frequent inquiries as to the relative merits of brick and asphalt are made. To these we reply that brick is cheaper, and, upon the whole, more durable than asphalt. It is certainly more durable on streets having light traffic, but there is a question as to its greater durability under heavy traffic.

Its chief objection is its noisiness. In small cities and towns, not located conveniently to an asphalt plant, the question of repairs is in favor of the brick, although asphalt can be repaired more satisfactorily than brick.

SPECIFICATIONS FOR BRICK PAVEMENT

The principal points in the specifications are as follows:

"On the layer of sand shall be placed a course of bricks, laid on edge, close together and in true line, with finished top even and

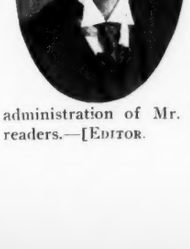


BRICK PAVEMENT IN FRONT OF CITY HALL, BUFFALO

parallel to crowning and at right angles to the curbs, except at street intersections, where they shall be laid in herring-bone fashion, care being taken to break joints two inches.

"The bricks in each course not to vary more than one-eighth inch in width, being carefully selected by gaging; any variation in depth to be corrected by using the proper amount of sand to bring those of less depth flush with top of pavement. The bricks are to be rolled, or rammed with a rammer of weight to be approved by the Chief Engineer; all rolling to be done with steam roller. In ramming, a plank is to be laid on the bricks, so that rammer face does not come in contact with the bricks. All broken or cracked bricks shall be replaced with whole ones, and no bats used except as closures at curbs.

"The joints are to be filled in accordance with the following: After the bricks have been rammed or rolled, the surface of the pavement must be swept clean, and into all the spaces between the paving bricks, and between the bricks and the curbs, shall be poured a cement composition of Portland cement of approved brand, and



Mr. Frank V. E. Bardol, C. E., has held the responsible position of Chief Engineer of the Bureau of Engineering of Buffalo, since the beginning of Mayor Conrad Deihl's administration. Under the charter he is to hold office during the pleasure of the Commissioners of Public Works, one of whom is elected by the people and two are appointed by the Mayor. Under Mr. Bardol are one first assistant engineer, seven assistant engineers, eight levelers, one superintendent of street repairs, one chief clerk, two clerks, one sidewalk clerk, one chief inspector, two draughtsmen, one keeper sewer inlet, and one stenographer. The work of this Bureau has never attained so high a degree of excellence as under the administration of Mr. Bardol. We take pleasure in introducing him to our readers.—[EDITOR.

TRYON PLACE, BUFFALO—BRICK PAVEMENT COSTING $2.92 PER SQUARE YARD

clean, coarse sand, in such proportion as directed, thoroughly mixed dry and then wet with water in a suitable box. The surface of the brick in the pavement having been properly wet, to allow the grout to run freely into the joints of the pavement, the grout shall be filled into the joints as expeditiously as possible and by such methods as the Chief Engineer may direct.

TESTS FOR BRICK

"In case a particular kind of brick shall be specified or named in any proposal and such brick shall not comply with these specifications or the tests herein provided for, the bidder or contractor shall not be relieved from his proposal or contract, but shall be required to furnish and use other brick that will comply with such specifications and tests.

"Within ten days after award of contract, the contractor must furnish to the Chief Engineer at least thirty samples of the kind of brick he proposes using, marked with names of contractor, maker and place of manufacture.

"The brick shall be sound, best quality, hard-burned paving brick, burned expressly for paving; they must be rectangular, straight, free from cracks, all rough projections and other defects.

"*Dimensions.*—The brick used shall be those known as the block size, not to exceed ten by four by four inches, but no brick from same manufacturer in same work to vary more than one-quarter inch in any dimension.

"*Crushing Strength.*—They must have a crushing strength of not less than 10,000 lbs. per square inch, when tested whole on edge.

"*Absorption.*—The average absorption of any three bricks must not be more than 3 per cent. of their weight when dried and immersed in water forty-eight hours.

"*Abrasion.*—If the average total loss of any three bricks be more than 30 per cent. of their weight when subjected to the prescribed abrasion test, the brick, of which they are samples, will be rejected.

"The first tumbling of bricks shall continue for 1,800 revolutions in a barrel three feet long and two feet diameter, with twenty-five to thirty-five revolutions per minute, containing about 100 pounds of scrap-iron and about 100 pounds of pig-iron.

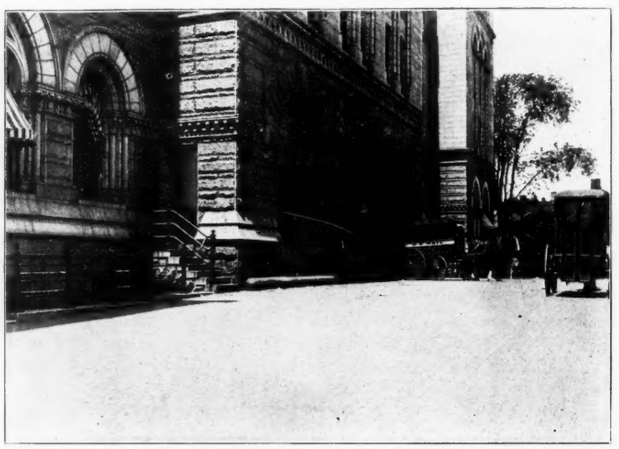
"The second tumbling of bricks shall continue for 3,600 revolutions in same barrel, with the scrap-iron only.

"All tests made before delivery of the brick are to determine whether the bricks are of such quality as are likely to fill the specifications. Upon delivery of the bricks the Chief Engineer or his assistant may select specimen bricks from those delivered on the street at any time during the progress of the work, and should these specimens fail to stand the tests above described, all bricks then delivered will be rejected.

REQUIREMENTS FOR MAINTENANCE

"In addition to the requirements of general specifications, during the period of maintenance whenever the surface becomes uneven, holding water more than one-eighth inch in depth, or when the pavement has settled over trenches, or heaved, showing a variation of more than three-eighths inch from the line of a four-foot straightedge, then shall the brick be taken up and relaid at proper crown and grade.

"If, in any continuous 300 lineal feet of the pavement, it is found necessary to repair more than one-third of its area, or if the cracks in the bricks exceed the proportion of three lineal feet of cracks to one of pavement, then shall all the bricks be taken up in the area included in the 300 feet and the curb lines, and be relaid.



BRICK PAVEMENT IN FRONT OF POST OFFICE, BUFFALO

"During the last year of maintenance the original surface of any brick in the pavement shall show not less than one-half the original width or thickness of such brick, and the wear or abrasion at the end of any brick shall not extend more than three-fourths inch from the end of brick.

"At such time the pavement shall be again grouted, if so directed by the Chief Engineer.

"In all these repairs such new bricks shall be furnished and laid as the Chief Engineer may require, all as specified above."

THE POPULAR DEMAND FOR BETTER ROADS

The Good Roads Train of Director Dodge Takes a Rest—Miles of Sample Roads Built in the South—Enthusiastic Conventions in Several States—The Triumph of Road Making Machinery—International Gathering of Good Roads People at Pan-American in September

By Martin Dodge *

THE reflex influence of the bicycle and the automobile has finally created a public sentiment that is crystalizing into the betterment of the public highways to an extent that is most gratifying to the good roads enthusiast. Many states which have failed to make any appropriation for the improvement of roads in the past, have this year yielded to the public demand and made, for them, liberal appropriations. The good example of Massachusetts, Connecticut, New Jersey, New York and other States is bearing fruit. In the aggregate, including the small appropriation made by the Government, millions of dollars have been set aside for the betterment of the country roads during this year. Canada is by no means a laggard, but rather well in the lead, when all things are considered, for she has appropriated $1,000,000 to be expended upon the improvement of the highways during the season.

WORK OF THE GOOD ROADS TRAIN

The good roads train, which has been touring the South during the past three months, was made up at Chicago through the co-operation of the National Association of Good Roads, the Illinois Central Railroad and several manufacturers of road-making machinery. The train started from Chicago on April 20th, equipped with eight carloads of the best and most important road-making machinery, expert operators, road-makers and engineers, arriving in New Orleans on April 22d.

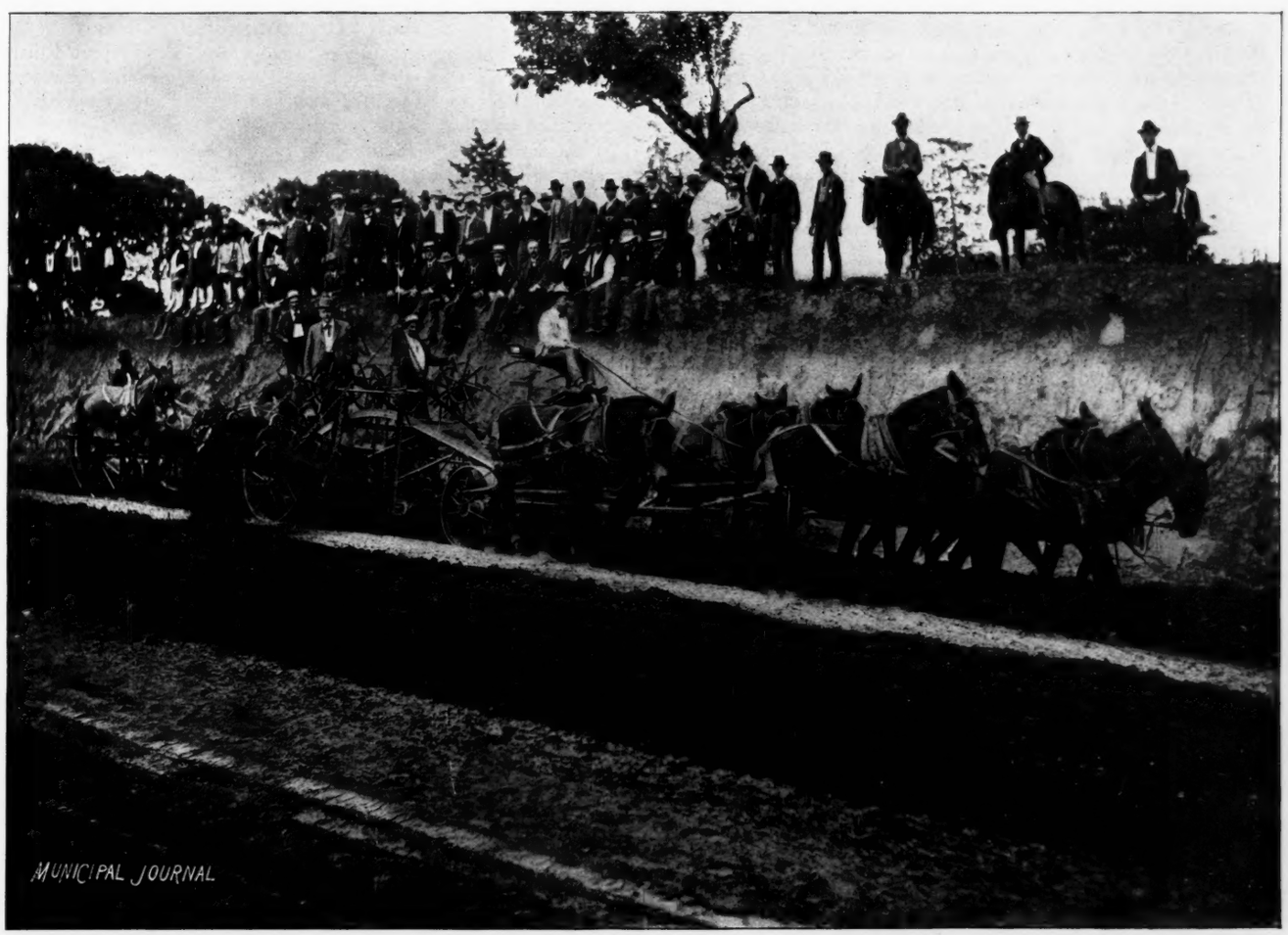
* Director of the United States Office of Public Road Inquiries.

The following week an object lesson road, about two miles in length, was built in the suburbs of New Orleans, over a low plain, formerly subject to overflow. It was desirable to raise the road-bed higher than usual so as to get above the action of the water, which softens the surface of a road so rapidly; therefore, earth-handling machinery was used to advantage. The "New Era" grader, propelled by twelve animals, was first put upon the work, and earth was transferred from the sides to the centre, at the rate of four cubic yards per minute. Within the short space of two days, the undisturbed earth was transformed into a smoothly finished roadway, over which automobiles could pass with perfect ease, as is shown by the accompanying illustrations.

LOUISIANA GOOD ROADS ASSOCIATION

During the week a state convention assembled for two days in pursuance of a proclamation issued by the Governor of Louisiana. Every parish of the State was well represented, there being about one thousand delegates in attendance. As a result of this convention a permanent state organization was formed, which will operate in co-operation with the National Association, to carry on the work already so well begun.

On the first day of May the train left New Orleans for Natchez, Miss., where it remained a week building another object lesson road and holding a district convention for two days; at the close of which a permanent organization was formed for carrying on the work in



THE MACHINE THAT HANDLES FOUR CUBIC YARDS OF EARTH A MINUTE

THE ROAD BUILT IN TWENTY HOURS

that vicinity, and for the purpose of co-operating with the State Association, afterwards formed at Jackson, Miss., and the National Association, formed last November at Chicago. We had here the hearty co-operation of the city and the county authorities. The object lesson road being built partly within and partly without the city of Natchez.

EFFICIENT WORK OF ROAD MACHINERY

Our next stand was at Greensville, Miss., where we arrived on the 16th of May. This is in the midst of the famous Yazoo Delta. The soil is an alluvial deposit, subject to overflow and inundation. A portion of this soil is known as "buckshot land" and is exceedingly difficult to handle and more difficult to retain in the form of a smooth road-bed. It was doubted whether the earth-handling machinery, so successful in other soils, would be able to handle this peculiar buckshot formation, but our efforts were crowned with success and we left them an object lesson of great value, in the form of smooth, well-rounded road-beds, raised well above the water level. We also had a very successful two-days' convention, which terminated with the organization of a permanent association for the improvement of highways.

LARGEST CONVENTION EVER HELD

I left the train temporarily at this point and the next stand was made at Granada and another at McComb City, and from McComb they went to Cambridge; after which the great convention was held at Jackson, Miss., where an object lesson road was built, as at each of the other places. The State convention was probably the largest and most successful of any road convention ever assembled in America and resulted in a permanent organization for the entire State.

From Jackson, Miss., the train went to Jackson, Tenn., where a similar programme was carried out. The next great stand was at Louisville, Ky., where I again joined the train on the 27th of June. The Governor of Kentucky had issued his proclamation for the State convention to be held here at this time and continue two days. This was well attended by eminent men from all parts of the State, and was one of the best conventions ever held in the interest of good roads. Governor Beckham was present and delivered an address full of encouragement for the cause and urging the people to industrial activity. A fine object lesson road was produced here just outside the city limits and a permanent organization formed for the purpose of carrying on the work in connection with the National Association.

THE TRAIN ENTERS KENTUCKY

The train went from Louisville to Hopkinsville and repeated there substantially the same work that had been done in the other places. Owensboro, Ky., was reached July 14th, and a most enthusiastic convention was held on the Fair Grounds in that city.

From here we crossed the Ohio river into southern Illinois and made a final stand at Effingham. It was expected that the train would move from here to Mattoon, but owing to a disastrous fire in that city, the engagement was cancelled and the great tour of the good roads train was closed. It is, however, the intention of Col. Moore, the President of the National Association, to take the train from Chicago to Buffalo and there hold another demonstration at the Pan-American Exposition.

ABOUT TO OPEN A NEW ROAD WITH NEW ERA GRADER AT NEW ORLEANS.—GOV. HEARD AND DIRECTOR DODGE STANDING ON THE MACHINE

HOW GLASGOW FOUGHT THE BUBONIC PLAGUE

A Lesson for New York and San Francisco—Drastic Measures Speedily Enforced—A Liberal Use of Water—A Fight With Smallpox as Well—Precautions in Garbage Department The City Soaked With Disinfectants—Cost Nearly $250,000

By D. McColl*

GLASGOW had the misfortune to be visited by the bubonic plague and smallpox epidemics during the past year, and it has been thought desirable that something should be known of the action taken by my department in connection with these visitations. The fact that special measures were necessary and were adopted might suggest to some that the ordinary cleansing arrangements of Glasgow are not sufficient. I should, therefore, at the outset, say that our system of cleansing is such that neither bubonic plague nor smallpox could conceivably originate from anything under the control of the cleansing department.

DRASTIC MEASURES SPEEDILY ENFORCED

Dealing with the bubonic plague first, it broke out while I was absent from the city, in attendance upon the congress of cleansing superintendents at Salford. Immediately upon receipt of the startling news I wired instructions to my assistant, and went home by the next train. I found that the locality where the outbreak had appeared was one of the worst in the southern district, and, in fact, in the whole of the city. The infected area was speedily defined, and the following cleansing measures put in force without delay: (1) The more frequent removal of domestic refuse, the ashpits within the area being emptied thrice weekly; (2) the hose-washing of all back yards, closes and passages nightly; (3) the disinfection of places so washed.

Within the prescribed area there are many better class houses, to which these precautionary measures were not applied. In connection with the lower class of property within the area there were 325 ashpits. These, as I have said, were emptied three times a week. The refuse collected from them amounted to about thirty-three tons nightly, or 100 tons per week, giving an average of only 200 pounds per ashpit to each emptying, and, frequency of the removal (considering the system) could scarcely have been improved upon. It ought to be explained that the ashpits are, as a rule, placed in the back yard behind the block of dwelling houses, and that in almost all the property within the prescribed area water closets are provided. Special precautions were taken in connection with refuse from properties where cases of plague had occurred. The contents of the ashpit were thoroughly disinfected before being put out, and care was taken to have the whole specially cremated. These arrangements worked out satisfactorily, and seemed to meet all requirements.

A LIBERAL USE OF WATER

If frequency of removal of refuse was necessary, the thorough cleansing of back yards and closes was equally so. At the Salford meeting last year, I described the new appliances devised by my department for hose-washing the streets of the city. And it was indeed fortunate that I had these at command for such an emergency. Believing as I did, that a liberal application of water was infinitely more effective than any other method for cleansing dirty streets, courts or passages, without hesitation I wired instructions from Manchester to transfer the street washing staff and appliances from the central district to the infected portion of the southern. Eleven hose reels, each with three men, were at once employed, and by these means every court and passage within the prescribed area was scoured nightly. Owing to the wide area to be covered, the washers worked in two sections, each under the supervision of a sub-inspector. Each reel or hose carriage was fitted with 150 feet of one and a half-inch hose, a reducing piece being used to connect it with the two and one-half-inch fire plug in the street. A flat nozzle, with two and a quarter inches by one-fourth of an inch was used. As in connection with the removal of refuse, a system of disinfecting was also arranged to follow the process of washing. The whole of the surface washed by hose, including the portion of the street where the ashpit refuse had lain, was watered with "chloros" in the proportion of one-half pint to two gallons of water.

* Cleansing Superintendent of Glasgow.

It will, of course, be understood that hose-washing of back yards can only be satisfactorily performed where the surface is paved with asphalt, granolithic, or some such hard, even and impervious material. Fortunately, the majority of the back courts in Glasgow are paved to admit of the surface being washed, and I believe that the frequent hose-washing, not only of our back yards and passages, but of our public streets, tends to check the dissemination of disease and to contribute to the preservation of the general health of the community. There were altogether twenty-seven cases of the plague, of which seven proved fatal.

A SMALLPOX EPIDEMIC AT SAME TIME

I now turn to the epidemic of smallpox. This scourge of cities, although more or less prevalent in Glasgow since March, 1900, only became epidemic in January of this year. The average number of admissions to hospital fortnightly, from March, 1900, to January 12, 1901, was twenty-one. During the fortnight ending January 26, the maximum number of admissions was reached, viz., 350, from which date onward a reaction took place, the fortnightly figures being as follows: 202, 127, 299, 161, 92, 67, 28, 18, 11, 2, as at June 15, 1901. The total number of cases was 1,777. The number of deaths was 230, which is equal to about 13 per cent. of the total number of cases.

METHODS FOR FIGHTING SMALLPOX

Within this area there are 2,304 ashpits, each serving about sixteen families. These ashpits, which were hitherto emptied weekly, were now given a bi-weekly service. As in the case of the southern district, the majority of the houses had water closet accommodation. The value of this provision in safeguarding a city from disease can scarcely be overestimated as compared with the primitive privy. The refuse from houses without water closets where cases of smallpox occurred was carefully cremated in the destructors. Some frequent emptying of ashpits on to the streets, together with other precautionary methods adopted, could not be carried out without considerable additional labor and expense, but, with our International Exhibition looming in the near future, the authorities were determined not to leave anything undone that might tend to speedily check the disease.

Disinfecting was freely resorted to. The process in this connection was even more elaborate than in the case of the bubonic plague. The refuse in the ashpits was saturated with a disinfectant before it was touched. After removal to the street it was again sprinkled with the solution, and, after being carted away, the portion of the street soiled with the refuse was hose-washed, and then disinfected, as were also the courts and passages over which the refuse had been conveyed.

WATERED STREETS WITH DISINFECTANTS

In watering the public streets of the infected districts a disinfectant was introduced into the water by means of a patent appliance. This apparatus, after being charged with permanganate of potash, was suspended inside the water barrel, and thus the disinfectant was distributed so regularly and well that a twenty-eight pound charge served for four weeks. This method insures an increased wholesomeness and purity not easily obtainable otherwise. As showing indirectly that these methods must have been efficient in combating the disease, I need only state the significant fact that of the total staff of my department, numbering 208, working in the eastern portion of the city infected by smallpox, only six men were attacked with the disease, notwithstanding the fact that a large proportion of them had not been revaccinated until the worst of the epidemic had passed. In this connection I may say that of the total staff of the department, numbering 1,205, 1,175 submitted to revaccination, leaving thirty who were exempted for various certified reasons. The bubonic plague cost the city $11,900, and the smallpox epidemic cost $225,000 more, making a total of $236,900.

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NEW YORK, AUGUST, 1901

IF a press dispatch is to be believed, St. Joseph, Mo., has taken a step backward by purchasing bloodhounds with which to track criminals. This practice is likely to promote laziness in the police department

DURING the present heated term there is considerable fault found with brick pavements on account of the rumbling sound, also on account of the arching of pavements. This is not the fault of brick pavements, but rather the fault of the engineer who laid them. When properly laid these defects do not appear.

NEW YORK CITY will soon follow the example of Rochester and Chicago by establishing a special court for children. Every city in the land should have its juvenile court room and a specially chosen judge to deal with the youthful offenders. It is to be feared that many criminals are made by present bad practices.

IT is better to have learned and lost than never to have learned at all, is a sentiment which may be applied to Jacksonville. The city fathers are now giving more diligent heed to the formation of a set of building laws which will prevent a repetition of its recent conflagration. Other cities would act wisely to profit by this Southern city's dearly bought experience.

BOUND copies of Volume X of the MUNICIPAL JOURNAL AND ENGINEER are now ready for delivery to any address, charges prepaid, at two dollars and fifty cents each. The volume comprises two hundred and forty pages of invaluable information. We have only a few copies and the edition will soon be exhausted. If you would make sure of obtaining a copy send in your order at once.

MAYOR TOM L. JOHNSON is living the strenuous life with a vengeance in these days. From the first hour of his official career he has been engaged in a continuous effort to bring about a better condition of affairs in the Queen City of the Lakes. Whether he is baiting his hook for larger fish, as friend and foe alike believe, or not, is of little consequence; he should be given credit for making an honest endeavor to better local conditions. His effort to equalize the burden of the taxation, in itself, is worthy of the highest commendation and will not be without its beneficial effects upon the chief executives of other cities. What Mayor Johnson has done others can accomplish. "Where there's a will, there's a way."

"AFTER the horse was stolen he locked the barn." This seems to be the policy of numberless cities. In reply to inquiries, the authorities of Jacksonville, Fla., and Houston, Texas, have written that our questions could not be answered because the records had been destroyed by fire. After the records are lost, furnish a fireproof vault for the safe-keeping of the new ones. It is better to act then than not at all, but it is wiser to build the vault before the fire.

COMPETITION between the asphalt paving companies has proven a blessing to St. Paul. There has been a war on for some months past and, as a result, the city is now receiving bids as low as $1.77 per square yard from the most reliable companies in the United States. One of the oldest companies in the business, which bid $2.63 per square yard a year and a half ago, recently submitted one for $1.94. We wonder why it costs $5.68 per square yard to pave Broadway?

DIRECTOR IMMEL, of the Water Works Department of Columbus, O., proposes to establish a uniform meter system. Under the present system, which is defective in several particulars, $500,0000 worth of water is pumped while the department realizes only $167,000 in return. The installation of meters on the domestic service as well as that of the manufacturers, and a fair charge per thousand gallons would undoubtedly place the balance on the right side of the ledger and at the same time be no hardship to the consumers. Several hundred cities have passed through a similar experience and have demonstrated the usefulness of meters as a remedy for water waste and a depleted income. This is a move in the right direction.

IN times of riot or strikes there is only one course for a public official to pursue, and that is the straightforward one. He should consider the welfare of the people, favoring neither one side nor the other. Mayor Dennis, of Wellsville, O., in a recent strike disturbance, according to a press dispatch, rose to the occasion and distinguished himself by doing just that thing. A non-union man, who had entered the town looking for work, and found it, was captured by the "pickets" of the strikers and threatened with violence, when the Mayor happened along and rescued him. While he expresses sympathy for the strikers he can see no justice in preventing any man from obtaining work, whether he belongs to the union or not.

IN the July issue we commenced a series of articles upon "Fireproofing Methods," by our Engineering Editor, which have been prepared from data gathered during the most important building epoch in the history of the United States. These articles call attention to the growing necessity for more restrictive regulations in regard to the erection of buildings within city limits. The value of such prohibitory measures will be readily understood in view of the frequent conflagrations in American cities. City officials are also urged to see to it that documents are deposited only in vaults or receptacles which are made absolutely fireproof. As an example of the good practice, the beautiful City Hall of Cincinnati is fitted out, from top to bottom, with fireproof art metal construction work, thus protecting all valuable records.

THE Chief Engineer of the Brooklyn Bridge, in reporting to the Commissioners of Bridges recently, about the break in that structure, said: "It was discovered that seven suspension rods and two cable bands were broken." It would naturally be supposed, by the foregoing, that the break was discovered by some inspector of the bridge in the routine discharge of his duties. The fact is, the bridge inspectors visit that structure so seldom that the bridge patrolmen do not know them by sight. The last inspection was made so long ago that it has been forgotten. There are few cities in the world where such a state of affairs could possibly exist. The people who pay for the use of the bridge every day want to know, and have the right to know, just what the condition of the bridge is. The cause of the recent break, whether by neglect or otherwise, should be ascertained on reliable authority and the mind of the people put at rest in so far as the safety of this structure is concerned.

THE bituminous macadam pavement which is being introduced in Boston, Hamilton, and other American and Canadian cities is a form of pavement which is at once cheap and durable. When properly laid it is capable of long usage and has been shown to stand heavy traffic. City engineers would act wisely in planning for next year's work, to examine this comparatively new form of pavement with care.

A SAN FRANCISCO newspaper is belaboring Mayor Phelan for all the increased expenses of the city government during his administration. It is unfortunate in its choice of an example, when it compares the expenses of the present efficient engineering department with the old and inefficient service rendered previously to the present administration. The transformation which has been wrought in San Francisco, in the engineering and other departments, since the reform element has had the direction of civic affairs is so marked that even the casual visitor cannot fail to notice it. Measuring the partisanship of this newspaper by the tone of its criticism, Mayor Phelan should feel highly complimented by its adverse sentiments.

THE Park Commissioner of New York City had the audacity, a short time ago, to sell a permit for the paltry sum of $500, to a private individual, authorizing the introduction of easy chairs into the public parks of the city. Although the fee charged for their use was insignificant in itself—only five cents—the proposition violated a principle involving the rights of the people as a whole, which was not to be tolerated. There is not a public park in the world, even in the countries of a monarchical form of government, where such a custom prevails. To have such a practice thrust upon a people of democratic notions was odious. The innovation met with such violent disapproval on all sides that the Commissioner thought discretion the better part of valor, and as a sort of penance for his unintentional offence, he purchased the chairs and presented them to the city. They will be distributed throughout the parks and will be reserved for the use of women and children, and words to that effect will be printed upon each chair. Thus endeth the chapter on the "Spate" park chairs. The episode has resulted in a new practice which it may be well for other cities to adopt.

A PUBLIC DEMAND FOR STREET CAR FENDERS

THERE are certain rights and privileges of quasi-public corporations, such as street car companies, which should be respected by civic authorities; and, on the other hand, the rights and privileges of the general public should be as carefully conserved by the corporations. It is to be regretted when there is any disagreement between these two parties over a question involving human life. The apparent refusal of the Metropolitan Street Railway Company, of New York, to equip its Broadway cars and those of some other lines with fenders, offers an example of criminal neglect on the part of the corporation, involving gross disregard for human life.

When President Vreeland, of the Metropolitan Company, was asked why fenders were not placed on the Broadway cars, now that they were run at a more rapid rate by electric power, he is reported as saying: "You can set it down as a fact that fenders are impossible on Broadway." In support of this statement Mr. Vreeland gives two reasons: First, that truck drivers do not fear the fenders as much as they do the front end of a car. If truckmen block the tracks too long the motorman can push the truck along till the driver's respect is gained, which could not be done with a projecting fender. Second, the curves are so sharp that two cars cannot pass on the curve if fitted with fenders.

In answer to the first contention, it should be borne in mind that, while no truckman has the right to block the way, he has a lawful right to use the streets. Ninety-nine times out of a hundred he is quick to respond to the ringing of the gong and turns to one side at the first opportunity without any other warning. In the exceptional case, the truckman's obstinacy is usually aroused by the insolent manner in which he is ordered to vacate. Even truckmen sometimes get mad, as well as motormen, under strong provocation, and are sometimes equally excusable. As to the second reason advanced, two cars should not be allowed to run around a curve in opposite directions at the same time. It is a custom which has already cost many lives in this and other cities. Civic authorities should enforce its discontinuance. These are trivial excuses, when considered with the more weighty objection that the non-use of fenders endangers the lives of thousands every day.

Grant, for the sake of argument, that conditions prevent the use of fenders on Broadway below Thirty-third street, that is no reason why they should not be used on Broadway above that point. The fenders are easily closed or opened, while the car is in motion. There, as on the Third avenue line and all its branches, the cars are run at a higher rate of speed, and the fender is an absolute necessity for the protection of pedestrians. This fact is recognized by the management, for the cars on Fourth, Sixth, and Eighth avenues, and many other lines, are equipped with fenders. There is apparently only one inference to be drawn from the statements of the president of the Metropolitan, and that is: The company can fit the cars with fenders, but it will not until obliged to do so.

The Mayor, Common Council and City Attorney form a combination in any municipality which is sufficiently strong to regulate all such evils. It is in the power of these city officials to compel a corporation to respect the lives of citizens. This much should be done even if other discomforts, of not as grave import, are allowed to continue at the pleasure of the corporation.

HOW NOT TO AWARD A CONTRACT

THE man who learns to profit by another's mistakes is the man who achieves the greatest and most rapid success. This also applies to the city. The recent episode in connection with the letting of the contract for the disposal of the garbage of New York City is a brilliant example of "how not to do it!" A brief recital of the facts in the case is the severest arraignment that can be made against the officials involved.

On July 13, 1900, forms of contracts for the disposal of the garbage of the boroughs of Manhattan and the Bronx were submitted to the Board of Estimate and Apportionment, and approved on August 21, 1900.

These forms were held by the Commissioner of Street Cleaning until July 12, 1901, when bids were called for to be opened July 27th, a few days before they became operative. The lowest bids received were: For Manhattan, $233,000 per year, for five years, to dispose of 140,000 tons of garbage only per year; for the Bronx, $66,960 per year for five years, for the disposal of about 170,000 tons per year of garbage and refuse.

The Commissioner recommended the acceptance of these bids.

A protest was filed with the Board, on the grounds that, among other things, the time allowed for consideration and preparation for the work was too short; that the bidders were limited in location to the confines of the city; that the prices named were excessive, as compared with those of other cities, and that no opportunity had been afforded for the presentation of methods that are in successful operation in other cities, such as London, Paris and Hamburg.

This protest was embodied in a statement, made by the engineer of the Furnace Department, and the bids were rejected by the Board. A subsequent appeal was made by the company's attorney, but the Board refused to reconsider its decision.

New bids were called for, striking out the clause of limitation of location, and making the term of contract one year instead of five.

The new bids were opened July 30th, two days before they were to become operative! One bid for the borough of Manhattan was $120,000 per year and the other for $140,000; and the one bid for the Bronx was for $30,000, about half the amount of the bids previously rejected.

These were rejected on the recommendation of the Commissioner, on the ground that they were incomplete in form, and in one case proposed a manner of disposal not permitted under the statutes. At the same time he recommended the acceptance of the bid, previously rejected, even though it was for nearly twice the amount of the last ones received.

The Board voted—three to two—in favor of the largest bid, awarding the contract to that company for five years, reserving the right

to purchase the plant from the company within three months from date.

This action commits the city to an increased expense of $142,000 per year, for five years, without proportionate increase in quantities to be destroyed. It bars from competition all other methods, compels the employment of works which have already been condemned as offensive to adjoining property owners, and continues a monopoly for the benefit of a corporation directly opposed to the interests of the city.

Moral: If you want to learn how *not* to administer the affairs of a city in an economical and effective manner, watch New York.

THE LEAGUE OF AMERICAN MUNICIPALITIES

THE League of American Municipalities will meet during the present month; and several of the State Leagues of Municipalities have been holding their sessions during the past two or three months. These meetings constitute a new and most auspicious development, worthy of careful consideration and coöperation at the hands of students of the municipal problem and those interested in freeing American cities from the stigma under which they have been resting. Indeed, there has been no more encouraging feature than the changed attitude of the municipal administrator toward the trust committed to him. The time was, and that not so far distant, when the average public official regarded his tenure of office mainly as a good opportunity to advance his own fortunes and those of his particular clique, faction or party. To the victor belonged the spoils was the policy almost invariably pursued. Now we find an increasing number of officials who look upon public office as a means of service; who regard their tenure as one of stewardship; who seek to be remembered for the good they have accomplished. It is not to be understood that the old order has passed away entirely or that the new one is completely inaugurated. There are too many instances to the contrary. The present administrations conducting affairs in two of our largest cities—New York and Philadelphia—bear all too direct and eloquent testimony to the effect that there are not wanting those who still consider the municipality as a legitimate object of prey and as a fair subject for exploitation.

The scandals attendant upon the Tammany and Ashbridge Administrations have attracted widespread attention throughout the country because of their brazenness and iniquity; but there are not wanting refreshing examples of public spirited endeavor on the part of mayors and councilmen to reëstablish our faith and convince us that after all municipal affairs are on the whole improving. If the desire to improve and to serve did not outweigh the desire to utilize municipal office for personal and partisan advantage there would be no League of American Municipalities or State Leagues. To be sure there are now and perhaps always will be those who will profess an interest in the higher life of cities to cover up ulterior purposes and designs; but this can no more be avoided than we can prevent rogues stealing "the livery of heaven to serve the devil in." We do not condemn the cause of religion because a scamp may become a Sunday School superintendent to enable him to work his rascalities less closely observed! No more should we condemn the earnest efforts of organizations of municipal officials, because there are those who identify themselves with them simply to create an erroneous impression of interest and so throw the unobservant off his guard. Hypocrisy is rather to be regarded as a tribute to virtue. If it did not pay to be virtuous, why take the trouble of pretending to be so?

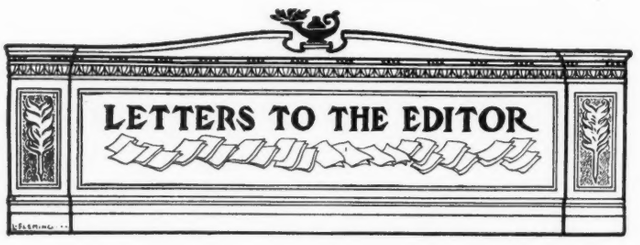
I have spoken of the encouraging side of such meetings and bodies as have been mentioned. I should now like to be permitted to utter a few words of caution. They must avoid the temptation to become occasions for mere junketing; they must not degenerate into mutual admiration societies and they must be willing at all times to coöperate with others who are working in the same direction.

As to the first I believe there is a growing disposition among those responsible for the conduct of the American and State Leagues to reduce the entertainment features to a minimum and make them subserve the ends the Leagues have in mind rather than become ends in themselves.

As to the second point there is an inclination on the part of men who are subjected to criticism at home to seek praise abroad from those who are similarly situated. I know that there is much unwarranted censure passed upon the most deserving official; but this is no excuse for going to the opposite extreme and assuming to be without fault. I have noticed a tendency to indulge in too many graceful personal compliments and too many merely personal allusions. The personal complimentary elements should be cut out and the time given to them utilized for discussion. There must, however, be abundant opportunities for the exchange of personal experiences. The helpful features of such meetings are the opportunities for public and private discussion of questions touching municipal government and its development.

All such bodies should become at once coöperating and coördinating centers of influence seeking to bring into closer touch and harmony all the elements working in behalf of the city's welfare. They should serve as exchanges of opinions and information. They should act as the leaders in all forward movements. They should aim to protect and conserve the highest interests of the city and to educate public opinion. The work which has thus far been accomplished by the California, Iowa and Wisconsin Leagues, not to mention others, is an earnest of the useful careers open to such organizations when conducted by men animated by a sincere public spirited purpose.

CLINTON ROGERS WOODRUFF.



METHODS OF GARBAGE DISPOSAL

JOHNSTOWN, Pa., July 5, 1901.

Editor MUNICIPAL JOURNAL AND ENGINEER:

I wish to avail myself of your kind offer to give the subscribers of THE JOURNAL the use of your Bureau of Information. This city is at present much interested in the question of the proper disposal of garbage and any information that you will furnish us in regard to modern plants for garbage disposal and the experience of cities where they are in use will be greatly appreciated by the Board of Health of this city and the special committee now considering the garbage question.

W. H. FREDERICK, *Health Officer.*

The same inquiry has been made by Mr. Ernest S. Parsons, an official of Gloucester, Mass., and others. A blank, incorporating the questions in the above, was immediately mailed to the cities of this class. The following replies have been received:

Bayonne, N. J., is divided into districts from which collections are made twice a week, costing $6,000 per annum. The refuse is dumped on sunken property and covered with earth. The system is not satisfactory and will be changed.

Cohoes, N. Y., contracts for the work at $200 per month. Weekly collections are made and the contractor must provide such dumps as shall not interefere with the public health. If the city should establish an incinerator, the waste must be delivered there without extra charge.

West Hoboken, N. J., spends $3,600 a year on its contract system for collection. The waste is dumped on unimproved meadowland.

Salem, Mass.—The ashes and rubbish are collected by contract at a yearly expense of $2,547. The Health Board removes the garbage by day work. Householders must place the waste in suitable receptacles, no pork, sugar or oil barrels being allowed, and all loose paper, etc., must be placed in bundles on top of the ash barrels.

Ashes and rubbish are collected by contract in West Newton, Mass., under supervision of the Health Board. They must be classified by the householders and placed in separate receptacles and separate wagons are provided to carry them away. Ashes are used

for filling and the other stuff is burned. Garbage is collected by contract in tight carts and taken to the contractor's piggery.

Waste and garbage is taken up by licensed scavengers, who are paid by can or load by the householders in Springfield, Mass.

Schenectady, N. Y., has licensed scavengers and they must collect in covered vehicles. The householders pay them about ten cents a barrel.

Ashes are collected in Fitchburg, Mass., every two weeks, by the city, at a cost of $1,447.14, and used to cap streets and sidewalks. Rubbish is collected twice a year at a cost of $409.54, and is placed on waste land. Garbage is removed by contract and fed to pigs. It costs $1,200.

Ashes and rubbish are collected in Holyoke, Mass., by the city at a cost of $18,000 per year and are used for filling. Garbage is by contract at $1,200 a year.

The contract system is used in Jamestown, N. Y., for garbage collection at $4,000 yearly cost. Rubbish is taken care of by the street department. There are few ashes as gas is used.

In Fort Wayne, Ind., ashes and rubbish are placed on the city dump. Garbage must be placed in covered cans to be kept dry, and, when collected by the city scavengers, is cremated with the combustible waste. In 1898 the crematory cost $6,697.16 to run. Three men are employed and the garbage costs twenty-eight cents per ton to burn.

The cost of collecting and disposing of garbage, ashes and rubbish in Birmingham, Ala., is $1,000 per month, done by contract. The ashes are dumped in sunken lots and the garbage is hauled outside the city and burned, but no incinerator is used.—[The Editor.

THE TAX RATES OF AMERICAN CITIES

Florence, Ala., July 13, 1901.

Editor Municipal Journal and Engineer:

I would like to know the tax rate of the various cities of the United States. I note in a recent number of your journal some reference to such a list. If you have the matter in any published form, I wish you would send it to me.

M. B. Weakley, *Mayor.*

Upon the receipt of the above letter inquiries to all the larger cities of the United States were dispatched and the replies received are given in tabular form as follows:

City.	Tax per $100.	Per cent assessed on valuation.
Springfield, Mass.	$1.40	Cash value.
Chattanooga, Tenn.	1.60‡	80% of cost.
Portland, Ore.	3.37‡	1-3 value.
Seattle, Wash.	2.55‡	50% true value.
Salt Lake City, Utah	3.22	Cash value.
Dallas, Tex.	1.65	2-3 market value.
New Haven, Conn.	1.35	Full value.
Augusta, Ga.	1.25	80% of value.
San Francisco, Cal.	1.07	60% to 70%.
Evansville, Ind.	2.78	80% of value.
Haverhill, Mass.	1.74	Full value.
Baltimore, Md.	1.81	Real cash value.
Harrisburg, Pa.	.70	60% of value.
Chelsea, Mass.	1.78	Full cost value.
Saginaw, Mich.	1.459 to 1.622	Real cash value.
Louisville, Ky.	1.50	80% of value.
Buffalo, N. Y.	1.81	Full value.
St. Louis, Mo.	1.90	65% of cash value.
Lawrence, Mass.	1.56	Fair cash value.
Detroit, Mich.	2.57	True cash value.
Omaha, Neb.	3.40	40% of fair value.
San Antonio, Cal.	1.70	2-3 of real value.
Pittsburg, Pa.	1.50	Cash value.
Rochester, N. Y.	1.56	Nearly full value.
Philadelphia, Pa.	1.85	80% of market value.
Grand Rapids, Mich.	.75	Cash value.
Auburn, N. Y.	1.51	Full value.
McKeesport, Pa.	.97	60% to 70% of real value.
Cleveland, O.	2.70*	60% of market value.
Allegheny, Pa.	1.60	Real cash value.
Camden, N. J.	1.96	Full value.
Columbus, O.	2.85*	70% of actual value.
Toledo, O.	3.04	60% of true value.
Lincoln, Neb.	1.10	80% of true value.
Duluth, Minn.	1.67*	40% of true value.
York, Pa.	.70	80% of true value.
Scranton, Pa.	2.64	1-3 of true value.
Reading, Pa.	.80	75% of full value.
Wheeling, W. Va.	1.04	2-3 of real value.
Providence, R. I.	1.60	Full cash value.
Waterbury, Conn.	3.80	1-3 of real value.
Albany, N. Y.	2.14	Real value.
Wilkes-Barre, Pa.	1.10	75% of market value.
Richmond, Va.	1.40	Fair cash value.
Norfolk, Va.	1.70	2-3 of value.
Chester, Pa.	1.95	85% of real value.

‡Rate for 1900. *Estimated rate.—[The Editor.

MANUFACTURERS OF STREET SIGNS

Hartford, Conn., July 24, 1901.

Editor Municipal Journal and Engineer:

We sent you our subscription yesterday for your publication for one year, and we ask you to send to us, as we understand that you have the information on hand for subscribers, the addresses of manufacturers of street signs, and greatly oblige

P. Hansling, Jr., *Supt. of Streets.*

The following firms are engaged in the manufacture of street signs: American Steel House Co., 796 Eleventh avenue, New York; Cæsar Bros., 112 Fulton street, New York; the Baltimore Enamel and Novelty Co., Baltimore, Md.; Thos. T. W. Miner, 821 Eagle avenue, New York.—[The Editor.

WATER CONSUMPTION IN ENGLISH CITIES

Brooklyn, Aug. 1, 1901.

Editor Municipal Journal and Engineer:

Can I trouble you to publish in your valuable paper some statistics relative to the water consumption in English cities? I should like to know the per capita daily consumption in gallons of such cities as London, Liverpool and others. Are meters used in Liverpool?

Malcom M. Labridge.

The following statistics will show the daily consumption of water in a number of representative towns with the total population of each:

Town.	Population.	Per capita supply.
London	5,490,791	31 gallons.
Liverpool	668,645	23 "
Halstead	6,100	17 "
East Ham	33,000	20 "
Chelmsford	11,079	23 "
Bristol	222,000	23 "
Bedford	29,023	25 "
Swansea	93,864	27 "
Nottingham	211,984	28 "
Wolverhampton	82,620	29 "
Grantham	16,746	39 "

In Liverpool, the introduction of water meters reduced the consumption per capita a day from 33.5 gallons to 23 gallons without placing any restrictions on the consumers. Equally favorable results have been obtained by the use of the meter in not only most English and European cities, but also in all American cities where the meter has been used.—[The Editor.

CONVENTION DATES

AUGUST

National League of Improvement Associations. Annual convention, Buffalo, N. Y., August 12-15.

Illinois Firemen's Association, Dixon, August 13-15.

The Pacific Coast Association of Fire Chiefs meets in its ninth annual convention at Tacoma, Wash., August 14-17.

Good Roads Convention, Albany, N. Y., August 14-15.

National Good Government League. Conference at Buffalo, N. Y., August 15-18. S. T. Nicholson, 6208 Pennsylvania avenue, Pittsburg, Pa.

New York State Firemen's Convention and Firemen's week at the Pan-American Exposition, August 19-24.

American Florists' and Ornamental Horticulturists' Association will meet in Buffalo, N. Y., on August 20-24. William J. Stewart, secretary, 67 Broomfield street, Boston, Mass.

League of American Municipalities will hold its annual meeting at Jamestown, N. Y., August 21-24.

The National Firemen's Association meets at Buffalo, August 22-24, 1901. D. W. Gillen, 176 Monroe street, Chicago.

State Firemen's Association Convention, August 24-25, Atlantic City, N. J.

"Municipal Day" will be observed at the Pan-American Exposition August 26.

International Firemen's Association, Indianapolis, Ind., August 26-29.

Municipalities State Convention, Colorado Springs, Colorado, in August.

Iowa State Firemens' Association, tournament at Marshalltown, 27-30.

The International Association of Fire Engineers meets in its twenty-ninth annual convention at Indianapolis, August 27-30.

SEPTEMBER

The Glasgow Engineering Congress, Glasgow, Scotland, will be held in September.

The Municipal Electricians will hold their meeting at Niagara Falls, September 2-4.

The New Jersey State Firemen's Association convenes September 9.

New Jersey State Firemen's Association holds its annual convention at Atlantic City, N. J., September 11. H. N. Brown, secretary, 407 Planek, Newark, N. J.

American Public Health Association will meet in Buffalo, N. Y., September 17-20. Dr. C. O. Probst, secretary, Columbus, O.

The Virginia State Firemen's Association meets at Staunton, Va., September 25-26.

Massachusetts Firemen's State Convention, Holyoke, Mass., September 25-27. D. A. Burt, secretary, 40 Water street, Boston.

OCTOBER

The International Cremation Congress meets in Buffalo, N. Y., October 1-3.

The American Society of Municipal Improvement meets at Niagara Falls, N. Y., October 1 to 4. D. L. Fulton, Allegheny, Pa., secretary.

The National Good Roads Convention will be held in Buffalo in October.

Pennsylvania State Firemen's Convention and Tourament will be held at Philadelphia, October 1-4.

Colorado Municipal League will hold its convention at Colorado Springs in October.

PERSONALITIES

—Dr. H. C. Sloggett is the new President of the Board of Health of Honolulu, H. I.

—The Republican organization of Buffalo, N. Y., will put forward as its candidate for mayor, State Comptroller Erastus C. Knight.

—While trying to preserve order in Santa Paula, Cal., Mayor Hugh O'Hara was shot and fatally wounded by a tough character.

—Chicago's financial condition has rendered necessary the discharge of the City Bridge Engineer, Edward Willmann, and the Assistant City Engineer, H. H. Jackson.

—Mr. Walter Firth has been elected the Superintendent of the garbage crematory of Trenton, N. J. He was formerly a Councilman and Chairman of the Street Committee.

—Mayor Van Wyck, of New York City, has decided to take the month of August for his vacation. President Guggenheimer, of the Borough of Manhattan, will be the acting mayor.

—Carter H. Harrison, Mayor of Chicago, has advised the Board of Review to seek out the rich in order to raise more taxes. He claims that there are many rich wives of poor men that escape taxation.

—Street Cleaning Commissioner Iglehart, of Baltimore, Md., may come to this city. He may accept the position offered him by Mr. J. J. Kennedy, a large contractor of New York, who is anxious to secure his services as an engineer.

—Miss Myra L. Dock, of Harrisburg, Pa., has been appointed to the position on the State Forestry Commission in place of Albert Lewis, of Luzerne County, resigned. The idea of appointing a woman originated with the Governor.

—John R. Sparrow, C. P. A., has been appointed one of the examiners of public accounts of New York City. He enters the board as the representative of the New York State Society of Certified Public Accountants and is a specialist on corporation work.

—Mr. Frederick Arnold Kummer, C. E., has resigned the position of manager of the Eastern Paving Brick Company, of Catskill, N. Y., to accept the general managership of the United States Wood Preserving Company at Room 181, Columbia Building, 29 Broadway, New York.

—Fire Commissioner John J. Scannell, of New York, has been indicted by the Grand Jury charged with "conspiracy to defraud and malfeasance in office." An investigation of the Fire Department's recent purchase of supplies was the cause out of which grew the indictments.

—Alfred Bowker, Mayor of the city of Winchester, England, is endeavoring to secure subscriptions from the people of the United States in aid of the arrangements for the commemoration of the 1,000th anniversary of the death of King Alfred the Great. The sum of $10,000 is still needed for the fund.

—Mr. Fred H. Gates has been elected City Clerk in the place of Frank Deitrick, who recently resigned to take a position with Kleybolte & Co., the bond house of New York. Mr. Deitrick has been connected with the city government for many years and he has proved one of the most efficient city clerks in the country.

—Mr. Fritz Morris, of New York, sailed on the Fürst Bismarck August 1st, with his wife and son, to make a tour of Sweden, Norway, Denmark, Russia, England, Scotland and France. He will travel as a special correspondent for the MUNICIPAL JOURNAL AND ENGINEER to acquaint its readers with municipal conditions abroad.

—Mr. Cecil B. Smith, Mem. Can. Soc. C. E., Assistant City Engineer, Toronto, Can., and Mr. William S. Aldrich, Mem. Am. Inst. E. E., Mem. Am. Soc. M. E., have formed the firm of Smith & Aldrich, with rooms at the Mail and Empire Building, Toronto, where they will carry on the practice of consulting engineers in the following branches: Civil, municipal, hydraulic, electrical and mechanical engineering.

—Albert L. Johnson, the street railroad promoter, passed away at his home on the Shore Road, Brooklyn, N. Y., on July 3d. He had been suffering from heart disease and the extreme heat of the early part of July was too much for his strength. He was born in Kentucky about forty years ago, and his whole life has been spent in connection with the railroad business. He started as a car driver on one of the Louisville lines, his brother Tom holding a better position in the same company. Tom soon went to Cleveland, where he obtained a franchise for a street railway. He soon had control of nearly all the lines in the city and Albert was taken into everything. The Johnson brothers became interested in the Nassau Railroad Company, of Brooklyn, N. Y., and Albert's best efforts were spent in the building of that system. He obtained the right to build a road on any street not already occupied by a railroad, a friend in the Aldermanic body having helped them to this sinecure. When he sold out his interests in the Nassau Company, he turned his attention to surface lines in Pennsylvania, and at the time of his death, in conjunction with his brother, held the controlling interests in the roads in sixty-six Pennsylvania towns. Last year he offered to reduce the street-car fares in Philadelphia to three cents, provided he received a franchise such as was given the Nassau road in Brooklyn. The franchise was not granted and then he wanted the Rapid Transit Commission in New York to allow him to connect Brooklyn and Staten Island with a tunnel. He did not succeed and attacked the plans of the Commission, but could not alter them. Three cent fares, the single tax, the public ownership of lines of transportation and, as many private franchises as can be secured, have been the watch-words of Albert L. Johnson.

ODD THINGS RELATING TO MUNICIPALITIES

Never Had a Saloon—Could Not Be a Councilman and a Christian—Nicknames of Cities—Bath House John of Chicago Inspires a Poet—Municipal Turkish Baths

COULD NOT BE A COUNCILMAN AND A CHRISTIAN.—A member of the McKeesport, Pa., Common Council recently resigned because he claimed that a man could not be a member of that body and remain a Christian. Thomas C. Baldridge, at a recent special election, was chosen to fill this vacancy. He is recognized as a Christian and is a trustee in the Methodist Church. He believes that it is his duty to hold the office and show that even a Christian can fill such a position with honor to his church and credit to himself. He will remain till the end of his term and then run for reelection.

CITY PLUNGED INTO DARKNESS BY JUNE BUGS.—The city of Zanesville, O., on the second Sunday evening in July was plunged into almost total darkness by a visitation of June bugs. They filled the air in countless numbers, actually smothering the electric lights with their burning bodies. The hotel offices were infested with such swarms that it was necessary to close the doors, notwithstanding the intense heat. In several instances church services were interfered with. The river bridges were almost impassable to pedestrians. The atmosphere about the lights was filled with clouds of live insects and floors were covered to a depth of several inches by dead ones.

HAS NEVER HAD A SALOON.—The city of Hoopeston, Ill., is an ideal temperance town, for it has never had a saloon. This has not interfered with its growth, for in 1890 it had a population of less than 2,000, and to-day its inhabitants number 3,823. The Mayor receives a salary of 50 cents a year; the remuneration of each of the Councilmen is one-half that amount and no fees are accepted. Hoopeston has paved streets, electric lights, a system of water works, a well-organized fire department, and more and better sidewalks than any other city of her size in Illinois, and the boast of her citizens is that liquor does not contribute $1 of license money to these improvements.

WANTS TO CHANGE JAWBREAKING NAME.—The town of Webster, Mass., has always been proud of the beautiful little lake within its limits, but never boasted of the jawbreaking name by which it is known. The lake has the longest and most unpronounceable name of any in the world, but residents and visitors who pass the summer on its shores and islands are quietly suggesting a substitute for the unwieldy Indian term which for many years has been applied to this body of water. Some of the business men think a change is sorely needed, because the lake resorts suffer financially and other business interests in Webster are greatly inconvenienced by the unpronounceable name. It is suggested that the question be discussed at a town meeting. The full name of the lake is Chargoggagoggmanchogagoggagungamaug, but the residents have contracted it to Chaubunagungamaug.

MUNICIPAL TURKISH BATHS are soon to be established in the city of Dover, England, in connection with the bathhouse on the sea front. It is estimated that their construction will cost about $18,000. The operating expenses per year, including salaries, fuel and interest on the loan, will aggregate $2,500. This is not the first bath of its kind that has ever been established in England, for one has been in operation at Folkestone for several years past. For the first two years it was run under municipal management at a loss. Last year it was leased to a manager at a rental which yields a revenue to the city of 2½ per cent. on the investment, and the manager states that he is satisfied with the arrangement. The weekly receipts for the past year have averaged $30, and since the beginning of the year he has sold 100 yearly tickets at about $16 each, and 150 tickets at $5, entitling the holder to ten baths.

HIS REQUEST SHOULD BE GRANTED.—Dr. Brooks, the Superintendent of Public Schools in Philadelphia, received the following letter the other day from Joseph Jamelo, Alepe House, Ashantee Road, Cape Coast.

"Sir—Your greatest affectionate name being recommended to me by an intimate friend of mine, as under your patronage and supervision the best schools in the city of Philadelphia are maintained, I beg most reverently and sincerely to apply to you to provide me literally a situation in your diocese, to dwell there, and to be trained intellectually, and if possible to be a handicraft. My intention to this humble petition is only due to the early calling of my parents to the land where

"'No more sighs, no more tears,
No more troubles and temptations,
But peace and prosperity abound.'

"Since then I have had a very meagre training, and, as American people are liberal, I dare say, having the Almighty as my will in all, as well as believing you to have some basis of truth, would listen to my request, so that you may deserve the verdict of 'Well done, good and faithful servant.'"

TOWN SOLD UNDER THE HAMMER.—The town of Lincoln, N. J., once the pride and hope of local woman suffrage agitators, was recently sold under the auctioneer's hammer for $16,000. The town was founded five years ago by Silas Drake, a land boomer, who organized the New Jersey Mutual Realty Company, which purchased a big farm and cut it up into building and factory sites. The place seemed a success from the start. Many houses were erected, factories were established, a trolley line was laid through the main street and the United States Government gave the town a post office. Soon afterward a municipal government was organized, and the first council of the place was composed entirely of women, equal suffrage prevailing at the Lincoln elections.

In the central square of the town a statue of Abraham Lincoln was erected, and the first letter sent from the Lincoln post office was directed by the president of the Woman Council to Robert T. Lincoln. The town looked like a big success, and investors began putting their money into the New Jersey Mutual Realty Company and finally secured control of it.

The property sold does not include the private residences and factories in Lincoln, but it does include the Town Hall, the schoolhouse, the statue of Lincoln, nearly fourteen hundred building lots and several factory sites.

NICKNAMES OF CITIES.—For years Buffalo's claim to the name "Queen City of the Lakes" has been hotly contested by Chicago, Detroit, Cleveland, and even Duluth, but no one could lay claim to "The Bison City," by which it has often been designated. It now adds another name to its list, which will probably not be disputed, "The Rainbow City," in deference to the remarkable electrical display which is the strongest feature of the Exposition. Chicago, during the period of the World's Fair, was known as the "White City," in acknowledgment of the staff on its fair buildings, but the title did not survive the close of the fair, and it has reverted to its former name, "Garden City," although it is more frequently referred to as the "Windy City." St. Louis, of all others, has, perhaps, the largest number of nicknames. It has been called the "Iron City," the "Mound City," the "Beer City," the "American Frankfort" and the "New Vienna." Years ago, Rochester, N. Y., was entitled to the name, "Flour City," on account of its large flouring mills, but that industry has long since followed the course of empire and gone West, and it can no longer claim that distinction. It is known, however, in these days, as the "Flower City," on account of the large nurseries surrounding it. Syracuse is known as the "Salt City," although it is no longer the leader in that industry. Pittsburg is the "Smoky City," and Cincinnati and Cleveland might lay claim to the same name. Among the names which have been longest associated with American cities are: "Gotham," for New York; "Baked Bean City," for Boston; "Quaker City," for Philadelphia; "Monumental City," for Baltimore; "Crescent City," for New Orleans, and "City of the Golden Gate," for San Francisco.

TO A CHICAGO STATESMAN.

THERE is grave doubt if the world will ever be charmed again with verses from the pen of Bath House John, of Chicago, for it is reported he has migrated to Colorado and become a farmer. This event affords inspiration to W. J. Lampton, "laureate poet" of *The Sun*, to reel off the following in his popular vein:

He lays aside the cares of State,
And from his lofty brow
He gladly plucks the Council crown
To milk his Jersey cow;
A mildly mannered, placid beast
That lows with keen delight
When Bath House John,
With apron on,
Comes forth to milk at night.

He leaves Chicago politics
Disturbed by wars and strife
Of forty dozen factional bands
That make a statesman's life
A seething cauldron of unrest,
And in the dew-kissed morn,
He sallies out
With merry shout
To shuck the ripened corn.

The deeply, darkly vicious things,
That make Chicago seem
To be a dreadful, dopified
And diabolic dream,
Have given place to pastoral scenes
In which the Sage appears
Serene and great
In happy state
Behind a yoke of steers.

He does not seek the sceptre now,
Nor yearns to mount the throne,
The ruler of a part of town
He well could call his own;
The crown of office is no more
A thing for which he begs;
He seeks instead,
In barn and shed,
The nests of new-laid eggs.

No longer Bath House John is he,
No longer bears the name
That thunders down the aisles of Time
And up the hill of Fame;
But Cincinnatus Coughlin, he,
With State cares laid aside,
Among his cows
And pigs and plows,
Becomes his country's pride.

MAYORS TALK ON MUNICIPAL OWNERSHIP

MAYOR J. J. HANFORD, SAN BERNARDINO, CAL.

"I am strongly in favor of municipal ownership of all public utilities—including water, gas, electric lighting, electric railways, etc."

ALBERT W. PHILLIPS, MAYOR, DERBY, CONN.

"I am not in favor of cities owning their water supply, gas or electric light plants providing they can and are being performed by private companies."

JESSE F. McDONALD, MAYOR, LEADVILLE, COL.

"Yes, I believe in municipal ownership of natural monopolies.

"Where they can be operated as cheaply by the city, the people should reap the benefit."

JOHN C. ANDERSON, MAYOR, BRISTOL, TENN.

"Municipal ownership is a beautiful theory. Its desirability must largely be determined by local conditions; sometimes by local politics. Where good service can be had at reasonable rates, I prefer private ownership of utilities.

"Municipalities are in greater danger from over bonding than from private corporations owning public utilities."

J. M. COMSTOCK, MAYOR, SPOKANE, WASH.

"I cannot answer your question by yes, or no, because the conditions around each city are different and every fair-minded man should take all the surrounding conditions into consideration. To illustrate, in Spokane we are paying to a private corporation $4.00 per arc light per month, so in answer to your question as to Spokane, I say no, in regard to a lighting plant. As to street railways, we could not buy them if we wanted to and I would not vote to confiscate them at present. So I say that the conditions ought to determine the answer."

MAYOR N. CAMPBELL, CROOKSTON, MINN.

"You may quote me as being unqualifiedly in favor of municipal ownership. This city has one great lack, and that is found in the fact that it is paying $163 per year, per arc light, for the lighting of its streets, instead of owning and operating its own electric lighting plant. In an unguarded moment the various franchises were bartered away to private corporations for a song. It is only of late years that our citizens have awakened to a realizing sense of present conditions, and they now find themselves practically helpless to apply the remedy, owing to the fact that improvident councils have, in past years, not only given away the public franchises, but at the same time have bonded the city to the limit allowed by law."

WILLIAM P. HAYES, MAYOR, SPRINGFIELD, MASS.

"I may say generally that I favor the municipal ownership and operation of what are called monopolies, such as water supply, electric and gas lighting, electric railway, etc.

"What the municipality has done with regard to the ownership and operation of its water supply, it certainly can do in the matter of gas and electric lighting. The lighting of a city and the furnishing of light to its inhabitants is, in my opinion, as much a natural part of the municipal administration as the furnishing of water, and the work could be undertaken and carried out with some good results both to the people and the municipality.

"With regard to street railways, I am inclined to the opinion that the time is not ripe for the municipal ownership thereof, although I expect it will come in time. As a consequence, I believe that the municipal ownership of water supply and electric and gas lighting should precede that of street railways, and the last named monopoly should not be undertaken until the municipality has made a success of municipal lighting."

MAYOR WILLIAM G. COCHRAN, TUSCALOOSA, ALA.

"I favor municipal ownership of water works, gas and electric light plants, because in this way the city can better provide for the citizens. The service can be rendered at a less cost to the consumer and to the city. The water supply, especially, should be owned and operated by the city, for pure water is one of the greatest essentials to good health and perfect sanitary conditions.

"Better fire protection is afforded under public than under private ownership, as has been demonstrated repeatedly. The service of a municipal electric light is not only better, but the profits on the business can and do maintain all fixed charges, and yet the price to consumers can be made at a lower rate than when the plant is under private control. Under private ownership the citizens are charged exorbitant prices for water, light and other commodities of a similar character, even though a private corporation is making money off special privileges granted by an indulgent people. Besides all this there are many of the public services, that is, to the city, which are obtained free of cost under public ownership.

"I do not favor the ownership of street railways in small cities."

CURRENT NEWS AND PRACTICE AMONG THE CITIES

Substitute for Personal Tax—War on the Mosquito—Regulation of Automobiles—Taxing Signs and Posters—Millions Offered for Street Railway Franchises

AN ARMY OF EMPLOYEES, numbering 50,000, is employed by the City of New York. The average salary amounts to $1,000 a year, which makes the annual payroll foot up to $50,000,000.

THE LARGEST SEWER in the United States is soon to be built in Brooklyn. It will be built of brick, and will be oval in form, with a maximum diameter of fifteen feet for a mile of its length.

PUT WIRES UNDERGROUND.—St. Paul, Rochester, and Troy and other cities are making strenuous efforts to have all wires put under ground and the conduits controlled by the city. Erie, Pa., has a municipal conduit, which is a model of its kind, and so has Baltimore. Wilkes-Barre, Pa., and even smaller cities, has its own conduit system.

SEVEN MILLION DOLLARS TO ART.—By the will of the late Jacob S. Rogers, the millionaire locomotive builder, of Paterson, N. J., the Metropolitan Museum of Art of New York City is to receive an endowment fund of anywhere from $5,750,000 to $7,750,000. His relatives, to whom he left eight bequests amounting to $250,000, will doubtless contest the will.

OFFERS MILLIONS FOR FRANCHISES.—The president of the Chicago City Railway has offered to pave every street, occupied by its tracks, from curb to curb with the best pavement, in return for a twenty-year extension of its franchise privileges, which expire in 1903. The railway occupies 210 miles of streets. The initial expenditure for the proposed pavements would aggregate $10,000,000.

TREE WATERING ORDINANCE.—Kansas City has passed an ordinance authorizing the Board of Public Works to employ a man and team at $3.50 per day, and an additional man as helper at $1.75. Within a few years past hundreds of trees have been set out at the public expense, the bulk of which has been assessed against the property owners reaping the benefit. The long continued drought has made this treatment necessary in order to save the trees from dying.

MUNICIPAL SUPERVISION OF ATHLETICS.—The Chicago ordinance for municipal supervision and encouragement of athletics has passed the council shorn of the provision for boxing exhibitions. The ordinance makes it the duty of a committee to "encourage the physical development of our people, and to educate them to a knowledge of the fact that indulgence in athletic exercises and sports will greatly benefit the physical and moral health of those who engage in such exercises."

THE LAW AND ORDER LEAGUE of Seattle and the better membership of the city council have won a victory in their campaign for the suppression of protected vice in that city. Committees of these organizations reported recently to the Mayor that evidence in their possession warranted the belief that the chief of police and one of his detectives had accepted bribes; and that open gambling was permitted in the city with the connivance of the police. The Seattle papers report that, with the official change already made, open gambling has ceased.

CITY PAYS ITS BLIND.—On July 23d, 440 of the blind poor of New York City received their yearly allowance from the city. Before July 1st, each applicant for charity leaves with the Superintendent of the Outdoor Poor a statement of his circumstances and his address. These are investigated and, if worthy, the applicant is entitled to a share of the fund authorized by the charter to be set aside for this purpose. The charter provides that the total amount shall not exceed $75,000, nor each one receive over $100. This year there was appropriated $33,250 and as 672 applied for help, the pro rata share was $49.47. Those who, through illness, were unable to appear at the Charities pier had the money forwarded to them.

DENSITY OF POPULATION OF FOREIGN COUNTRIES.—The following figures of the population of various countries and number of persons per square mile are based upon the latest census taken:

Country.	Year.	Population.	Per square mile.
Russia	1897	128,961,691	2.2779
United States	1900	76,215,129	3.2432
German Empire	1900	56,345,014	40.2316
Japan	1898	43,760,754	44.1698
Great Britain and Ireland	1900	40,909,925	50.9652
France	1898	38,745,000	27.8764
Italy	1898	31,573,582	41.1583
Austria	1900	26,107,304	33.5907
Hungary	1900	19,203,531	23.0116
Spain	1897	18,089,500	13.8610

GREATER PITTSBURG is a possibility of the no distant future. The population within the present city limits numbers about 330,000. The Chamber of Commerce of that city recently took action upon a resolution which calls for the uniting of practically all the ten or more boroughs and cities within Allegheny county, which form practically one homogeneous whole, with a total population of over 800,000, which, if consummated, will place that city the fourth in size within the United States. The Pittsburg district now has a greater production than any other city in the world in steel and iron, plate glass, tin plate, pickles, petroleum, steel cars, air brakes and electrical machinery, window glass and tableware, steel and wrought iron pipe, coal and coke, corks, natural gas, fire brick and clay. During the year 1900 the freight handled in Pittsburg amounted to 65,000,000 tons, by far the largest of any industrial centre in the world.

REFORM STARTED IN OMAHA.—About 250 of the leading business and professional men of Omaha, Neb., have organized a non-partisan municipal league, with the object of correcting certain evils that are said to exist in the city government. The next municipal election in Omaha does not occur until April, 1903, and by that time the reformers expect to have a league that will be sufficiently strong in membership and influence to elect whatever candidates it may indorse.

One of the leading daily newspapers of Omaha antagonizes the new league editorially, asserting that its promoters are not acting in good faith, but are merely working a shrewd scheme to place themselves in office. To offset the attack made upon it by the newspaper in question, the league, at its last meeting, adopted the following by-law:

"Any officer of this league or member of its executive committee who accepts a municipal nomination for membership on a campaign committee thereby resigns his particular office in this league."

SUGGESTS SUBSTITUTE FOR PERSONAL TAX.—A. H. Hennings, City Treasurer of Omaha, Neb., suggests that a graduated business tax be substituted for personal property taxation. Mr. Hennings says that the present system of personal taxation, as it is administered, results in the debauchment of the moral sense of citizens and is nothing short of a school of perjury. He declares that unjust burdens are imposed upon the man who is scrupulously honest and upon the administrator of an estate whose affairs are a matter of record. He submits the following schedule for a business tax:

Annual Sales.	Mills.	Tax.
$ 100 to $ 5,000	..	$ 5
5,000 to 10,000	01	10
10,000 to 20,000	01¼	25
20,000 to 40,000	01½	60
40,000 to 60,000	01¾	75
60,000 to 80,000	01⅞	150
80,000 to 100,000	02	200
100,000 to 200,000	02⅛	425
200,000 to 400,000	02¼	900
400,000 to 600,000	02½	1,500
600,000 to 1,000,000	02¾	2,750
1,000,000 to 1,500,000	03	4,500
1,500,000 to 2,000,000	03¼	6,500
2,000,000 and over	04	12,000

The scheme contemplates the abolishment of the taxation of personal property.

REFORMERS AT WORK.—The citizens of Philadelphia are endeavoring to show complicity between the police department and the disorderly houses of that city. Also, they are making an effort to counteract some of the effects of bad politics in city affairs.

PARKS ALWAYS OPEN.—The parks of Syracuse, as in most other cities, are only open to the public until a reasonable hour at night. Alderman Freeman has introduced an ordinance which provides that the parks be thrown open to the public both day and night.

TREE PLANTING IN NEW YORK.—The Tree Planting Association of New York reports that since the first of the year it has planted 931 trees in the streets of the borough of Manhattan, and 1,949 in other boroughs of the greater city, making a total of 2,880 trees.

ELECTRIC LIGHTS IN MEXICO.—The City of Mexico spends more than $26,000 a month for light, using 501 arc lights of 2,000 candlepower and 383 of 1,200 candlepower, in addition to a considerable number of smaller incandescent lights for some of the narrow streets and small squares. During the month of March the large arc lights were burned on an average of ten hours and eighteen minutes per day, at an average cost of 11.7 cents an hour. The average cost an hour of the 1,200 candlepower lights was 7.48 cents. Both sums are given in Mexican silver.

THE TREND TO CITIES is illustrated by the following statistics of population:

France.	1881.	1891.	Per cent. of increase.
Paris	2,269,023	2,447,957	7.75
Other large cities	3,937,910	4,414,864	12.11
Small cities and country districts	31,465,115	31,480,370	0.05
England.			
London	3,815,544	4,211,056	10.37
Other large cities	8,098,112	9,547,079	17.89
Small cities and country districts	14,060,783	15,242,883	8.41
Scotland.			
Large cities	1,206,401	1,334,901	10.65
Small cities and country districts	2,529,172	2,698,202	6.68

TAXING SIGNS AND POSTERS.—Among other regulations which Oakland, Cal., imposes upon street signs is a license fee of three dollars per year. In Duluth, Louisville, Utica and Milwaukee steps have been taken to secure city ordinances or State laws that shall impose a stamp tax upon posters, graduating the tax according to the size of the poster. In the single city of Paris the income from the advertisement tax is said to amount to about $750,000 a year, and in Berlin it is almost as much. And this result is gained through no persecution of the advertisers. In fact, where the poster tax has been tried it is not less popular with the advertisers than with the general public, for the degree of relative prominence—which is the thing that mainly counts in such advertising—is not interfered with. Signs on the place of business are not usually taxed, and the only forms that suffer much are the dodgers, which litter the streets, and the signs on dead walls and fences. The former are a nuisance well rid of, and which the ordinary advertiser would not be sorry to dispense with if he were sure that others would dispense with it, too. The latter destroy the town's dignity of aspect, violate all rules of civic art, and put a premium on crude wall space—to the undoing of good architecture. The theory underlying efforts to check excesses in this business of "jumping at the eyes," is that one has no more "right" to attack the eyes of the public than to attack its ears.

REGULATIONS FOR AUTOMOBILES.—The park authorities of New York limit the speed of automobiles to seven miles an hour when the road is clear and to one-half that speed when passing horse-drawn vehicles.

In San Francisco motor vehicles before they can enter Golden Gate Park must be examined by the park engineer, who, if he deems it wise to do so, issues a permit to the chauffeur. The latter thereupon receives a square leather sign bearing a certain number, which must be displayed conspicuously upon the automobile during its passage through the park. For all a fee of $2 is charged, and the chauffeur is further subject to the prevailing rules of the road regarding speed and the conduct of his vehicle.

In Louisville all automobilists who desire to ride in the parks must have a permit. A number corresponding to that of the permit and printed in white upon a black leather tag large enough to be seen at a distance is provided, and this tag must be exhibited from the rear of an automobile upon its entering any of the parks or parkways. Specified sections of the parks are forbidden absolutely to the horseless carriages, and their owners are further required to observe strict rules concerning the methods by which they are to give warning of their approach.

New Haven's Park Commissioners have recently ruled that automobiles shall be barred entirely from three of the principal parks of that city.

WAR OF EXTERMINATION AGAINST THE MOSQUITO

THERE is a widespread complaint against the mosquito, which includes nearly every city of prominence and many smaller ones, in the United States. All sorts of charges are laid at the door of the offending insect; that he is a nuisance, a spreader of disease, such as malaria, smallpox, typhoid and other fevers. Authorities have satisfactorily established all these claims, so that there is no reason why the war should not be pushed to the bitter end.

Petroleum has been the most universal remedy employed thus far. Its use has been spasmodic and limited to small areas, and there has been no systematic effort made in any one locality, accompanied by careful observations as to the results obtained. Dr. Alva H. Doty, Health Officer of the city of New York, has fitted out an expedition well equipped with specially devised apparatus for an extensive invasion of the enemy's country. Thoughtful plans for scientific observations upon which to base conclusions and evolve some efficient method which may prove universally successful have been matured.

The first onslaught against the pestiferous insect was made the other day under the leadership of Dr. Doty, who was accompanied by three sanitary policemen and five laborers. The oil tank wagon contained one hundred gallons of crude petroleum. Another wagon carried the party and the apparatus, including the spraying raft, force pump, long lengths of garden hose and scythes.

Staten Island was the scene of the first operations. When a pond was reached the tank wagon was driven as close as possible to its banks, the raft was floated with the gridiron spraying apparatus suspended by chains beneath it. While one man worked at the pressure pump two others drew the raft to and fro over the surface by long ropes, until every part had been traversed. The oil, discharged in tiny streams some fifteen inches beneath the surface, quickly rose carrying myriads of minute wigglers, the mosquito larvae, to the surface and killing them, at the same time forming a light scum over the pond and preventing such larvae as escaped the oil from obtaining enough air to support life.

These operations have been repeated several days in succession, and the residents in the region where the experiments have been tried report that there has been a radical diminution in the swarms of mosquitoes with which they were previousy troubled. Whereas, formerly it was impossible to sit out of doors at night in any place unprotected with mosquito netting without being fairly eaten up with them, now it is not at all unpleasant to sit in the open air at night for hours at a stretch.

Dr. Doty says that he is learning a lot about the habits of mosquitoes in these expeditions. One thing which has particularly attracted his attention is the fact that during the day myriads of the insects find refuge in the grass, weeds and underbrush adjacent to their breeding places. The mosquito is of a delicate organization, and it seeks refuge from the sun, high winds and storms, in this undergrowth. Without this refuge they would be destroyed or compelled to migrate. The doctor has consequently determined to cut away the undergrowth more thoroughly than at first proposed, and for that reason additional men will be employed.

FOUR MONSTER MEETINGS OF NATIONAL ORGANIZATIONS

International Firemen Go to Indianapolis—Municipal Electricians to Niagara Falls—The National and Empire State Firemen Gather at the Pan-American

THE INDIANAPOLIS CONVENTION

On August 27 to 30 the twenty-ninth annual convention of the International Association of Fire Engineers will take place at the Masonic Hall in the city of Indianapolis, Ind. Representative men from all parts of the United States and Canada will assemble to discuss subjects and consider questions of vast importance to those interested in the protection of property from fire. Among the topics selected by the Board of Directors at a recent meeting are the following:

The danger to firemen, when fighting fires, from electric light and trolley wires; what would be the best enforced method to prevent danger from chemical explosives; driven wells for fire purposes; the basis upon which private fire departments should be organized to make them most effective; whether the present methods of fighting fires unnecessarily increase losses by water.

The value of these conventions as a means of education to those attending cannot be overestimated, for they bring together men from all parts of the country and ideas are disseminated that would not otherwise be brought out. The broadening influence of the discussions cannot fail to impress one, and experience has shown the worth of the practical information gained thereby.

Many cities do not seem to appreciate the immense advantages to be derived by their chiefs attending such a gathering and the expenses of such officers must come from their own pockets, but there are some cities that are not so narrow minded, which gladly pay all expenses because of the benefits that will necessarily accrue to them through the better qualifying of their chiefs to serve their several departments. From the wisdom and experience of others they become familiar with the most approved methods of extinguishing fires.

Hotel accommodations can be had all the way from $1 to $5 per day, either on the European or American plan. The Central Passenger Association has granted a one and one-third rate for round trips and even better arrangements may be made. Any further information can be secured by addressing the secretary, Henry A. Hills, Wyoming, Ohio.

INTERNATIONAL MUNICIPAL ELECTRICIANS

The sixth annual convention of Municipal Electricians, to be held at Niagara Falls, N. Y., on September 2, 3 and 4, promises to be of great interest to all municipal electricians, if one may judge from the programme that has been planned. Special papers have been prepared pertaining to matters that are of vital interest to municipal electricians the world over. Features that have never been attempted before in convention work will be undertaken here. Those who expect to attend the Pan-American Convention at Buffalo can easily take a run out to the Falls and not only attend the convention, but see the most wonderful sight on the American continent. The official badge adopted at the Elmira meeting will be worn by the active members and those who have not one of these badges may obtain one upon application to the secretary at the Niagara Falls meeting.

Not all the time will be devoted to business, for special features of entertainment have been provided for the members and their friends during the evenings and the afternoon of the 4th. A trip through the Niagara Falls Power House, which alone is worth the trip, is one of the interesting events planned.

Five papers will be presented that will be of especial interest to the municipal electrician. The paper by a well-known electrician on the "Inadvisability of placing high and low potential wires through the same series of conduits or through the same manholes," touches upon a subject that is being discussed in many cities.

Special facilities will be offered by the various telegraph and telephone companies to the members, and one or two have already offered the free use of their lines during the sessions.

Those who desire accommodations can have the same secured by communication with M. J. Donohue, Superintendent of Fire Telegraph, or W. G. Green, 473 Second avenue, Niagara Falls, N. Y. Service at the hotels can be had at from $1.50 to $7.50 on the American plan, or from 75 cents to $3.50 per day on the European plan.

THE NATIONAL FIREMEN MEET AT BUFFALO

The National Firemen's Association will hold its convention at Buffalo on August 22, 23, 24, during the latter half of "Firemen's Week." The hospitality of the "Rainbow City" and the sights of the exposition will not distract the attention of the "laddies" from the work of the convention. The topics that will be uppermost in the minds of all will be those that pertain to the broadening and deepening of the association's organization. The speakers and topical writers will discuss what legislation can be secured for firemen. Even topics in French on the European federations will be presented and translated into English.

Three well attended conventions have already been held, but the great body of isolated state, county and district associations have never yet come together in national unity and the workers of this convention hope that all will come and become acquainted.

Other things than grave discussions of fire matters will serve as attractions to the visiting fire fighters. Excursions to Niagara Falls will be given every day and everything for the comfort of the visitors and their friends will be looked after by the local committee at Buffalo.

The transportation committee of the association has selected the Wabash railroad as the route from Chicago. The "Firemen's Special" will leave the Dearborn station, Chicago, at 3 p. m. Monday, August 19th. The fare for the round trip will be $13, and will be good for ten days. The rate of $1 a day, on the European plan, has been secured by the committee.

FIREMEN'S WEEK AT THE PAN-AMERICAN

Firemen all over the country are looking forward with great interest to the Firemen's Week at the Pan-American Exposition, which begins August 19th. A good time is anticipated. If numbers can secure enjoyment, the latter will surely be attained, for there will be more firemen assembled at the exposition during that week than ever were gathered in one spot before in the history of the country. Exempts, volunteers and paid firemen from all parts of the United States and Canada will be in the great throng. There are about 375,000 firemen in this country and a fair proportion of this number means a tremendous crowd.

The contests at the Stadium on August 22d will not alone be interesting, but will be the most exciting that have taken place for many years. There will be a large number of entries for all the events, and this will be true especially of the hose races. The famous Independent Hose Company, of Martin's Ferry, Ohio, which is the champion of the world, will be ready to defend its title against all comers. The hand engine contest will be, without doubt, the most novel and exciting among the events. New England will be largely represented, as there these contests are always very popular, but several New York companies will be on hand to strive for the honor of the "Empire State." This will be the first time in forty years that a hand engine contest has taken place at Buffalo. Chief George Cushman, of Hingham, Mass., who has officiated as judge in more than seventy of these contests, will assist the local judges in picking the winners.

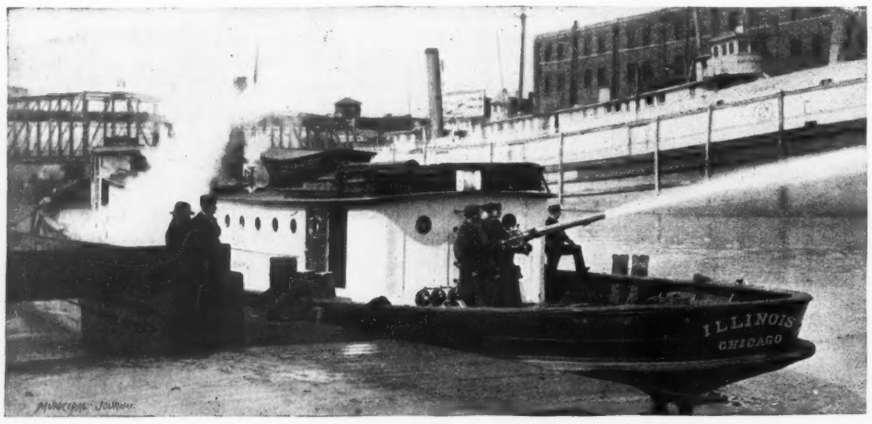
A feature of the week will be a mammoth parade in which more than two hundred firemen's associations will be in line.

THE FIRE FIGHTING FLEETS OF AMERICAN CITIES

The Imperative Need of Fire-Boats--The Powerful "Illinois" of Chicago--Splendid Equipments in All Large Cities on Ocean or Lake—Old Fogy Notions Prevail in London—Used to Break Ice and Keep Channels Clear in Northern Cities

By Walden Fawcett

PRACTICALLY every city of great size in the United States is situated upon a body of water of one character or another, and the problem of devising means for battling with flames in the districts contiguous to water-fronts has been one of the most perplexing which has confronted scientific fire fighters on this side of the Atlantic during the past two decades. Originally it was the idea that craft of some kind equipped with apparatus for throwing streams of water might, on the occasion of conflagrations near the water-front, assist the regular engines used exclusively on land; but in later years, when towering elevators and manufacturing plants were erected directly upon the dock lines and the entire surrounding territory was, in many instances, congested with lumber yards and other establishments calculated to serve as well nigh insurmountable obstacles to fire department workers, it became apparent that practically the entire responsibility for handling fires in such localities must devolve upon the floating equipment. The great disaster in New York a year ago, when several ocean steamships were destroyed, served to emphasize the existence of the floating branch of fire fighters.



THE FIRE-BOAT ILLINOIS

AMERICAN IDEAS SUPERIOR TO EUROPEAN NOTIONS

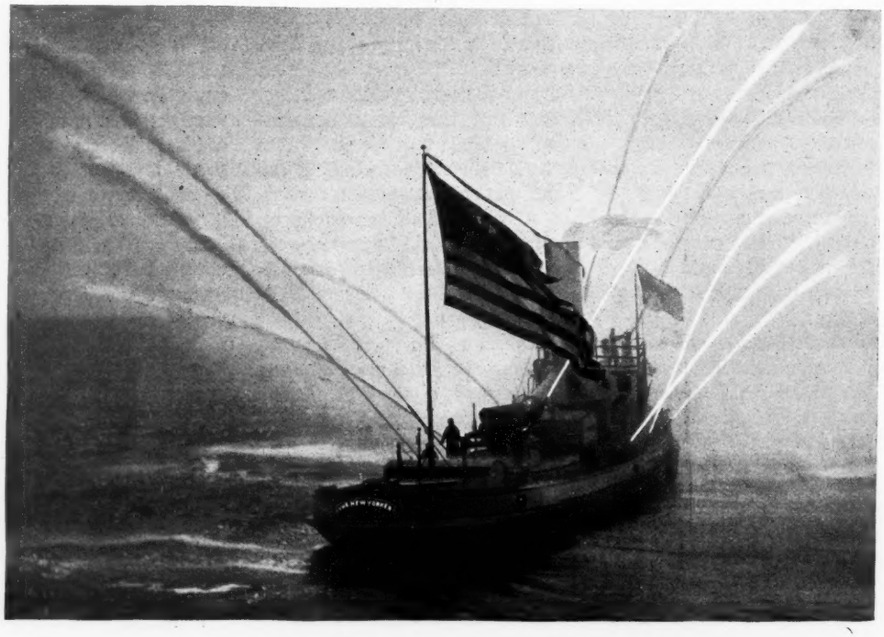
From the outset American fire departments have relied for their marine operations upon various forms of fire-boats which are, in effect, tugs or small steamers equipped to serve as floating fire engines of great power. This type of vessel may well be said to be distinctively American, since practically every step in its development has been taken in this country. The utilization of this class of fire equipment has placed the fire departments of this nation in the front rank, in so far as water-borne apparatus is concerned. How superior present-day facilities are to those abroad may be imagined from the fact that in London the equipment for maritime fire fighting consists of eight engines on barges; twelve barges for carrying engines and seven steam tugs for moving these barges from place to place.

By no means all the most interesting boats in the United States are to be found along the Atlantic coast. Some of the most powerful and costliest vessels of this kind are in service on the Great Lakes. One of the finest of these is the fire-boat "Illinois," constructed a few years ago for the city of Chicago. The conditions existent in this vessel's field of work made it imperative that she should be an exceptional craft in many ways. The Chicago river, which is lined on both sides with large buildings, many of them of frame construction, is a narrow and tortuous stream, and it was obvious, therefore, that while the fire-boat must be able to move quickly she must also be susceptible of turning suddenly and sharply, and so staunchly constructed that in ordinary collisions with wharves or vessels she would sustain no great damage. Finally, it is essential that the vessel being intended for all-the-year service shall be able to plough her way through the ice floes which form in the Chicago river in winter.

THEIR IMPERATIVE NEED IN CHICAGO

The "Illinois," which cost $68,500, is built of steel, her hull having four water-tight bulkheads and the forefoot being so cut away that the vessel can run up on the ice and break it away. The boat is 118 feet in length, twenty-four feet in width, twelve and a half feet depth, with a draught of nine feet. On the main deck there is provided a steel deckhouse sixty-nine feet long and fourteen feet wide. Rooms are provided for hose and for the clothing of the firemen. In every part of the vessel the woodwork has been reduced to a minimum.

Perhaps the most interesting feature of the machinery installation on the "Illinois" is the battery of fire pumps. There are three double-acting, vertical, single, duplex, crank and flywheel pumps, the trio weighing about twenty tons, each pump having a minimum



FIRE-BOAT NEW YORKER THROWING TEN STREAMS

TYPICAL BOAT OF BOSTON'S FLEET

capacity of 3,000 gallons of water a minute. Connecting with the set of pumps are ten-inch circuit pipes which pass along the sides below deck and come together forward of the deckhouse in two stand pipes fitted with adjustable nozzles. When these great water guns are in operation they are capable of sending solid streams of water with incredible force, which, even at a great distance, have sufficient power to demolish any ordinary brick wall. At intervals, along the sides of the vessel, also, there are valves and hose connections. For actuating the single screw which propels the "Illinois" there is a vertical inverted high-pressure engine to which steam is supplied from two boilers twelve feet in diameter and eleven feet in length working at a pressure of 140 pounds.

MOST POWERFUL FIRE-BOAT IN THE WORLD

The "Illinois" is considered from all standpoints—speed, handling in narrow waterways, and amount of water delivered by its pumps when in actual fire service—the most powerful and efficient fire-boat in the world, but it is anticipated that even this craft will be surpassed by the magnificent fire-boat which is to be constructed for the city of Milwaukee and which will cost when complete fully $100,000. This proposed vessel, while modeled on the lines of the "Illinois," will be somewhat larger.

It is possible for a first-class fire-boat to be transformed almost at a moment's notice into a fountain, spouting fourteen streams of water simultaneously and in this, more than in any other capability, perhaps, is to be found the secret of the wonderful efficiency of such a vessel in subduing flames.

The requirements of modern fire-boats are much more exacting than was the case a few years ago, mainly because of the extensive introduction pipe line systems through which the fire-boats must force immense quantities of water at very high pressure. In order to meet the new responsibilities thus presented the double pumps heretofore in use have been displaced in some of the new fire-fighting vessels by vertical, triple fire pumps, embodying the triple feature in steam and water cylinders. There is also a disposition to increase the number of hose connections provided, and on the fire-boat "Battle," recently completed for the Detroit Fire Department, there are twenty three-and-a-half inch hose outlets—ten forward, six amidships and four aft.

OTHER USES FOR FIRE-BOATS

One of the chief objects in designing a fire-boat is to arrange for the largest possible amount of machinery in the smallest possible space. Naval architects assert that it is practically impossible to provide a fire-boat that will be capable of very high speed by reason of the fact that the hull must be full and bluff at the bow in order to hold all the machinery necessary. It is claimed, however, that a speed of fourteen miles an hour—the maximum rate of the average fire-fighter—is, to all intents and purposes, as good as a rate of twenty miles an hour, inasmuch as the difference in speed would count for little or nothing in so short a distance as the run between points on a city's water front.

The use of fire-boats in cities located on rivers, for the purpose of breaking up the ice which forms in the channel, has proven of the greatest benefit to navigation interests. In some of the vessels, in addition to the usual steel plating or skin covering, the frames of the craft, a steel belt three-quarters of an inch in thickness has been worked all around the vessel at the water line for the further protection against the heavy ice. The fire-boats are provided with life-saving equipment and in some cases with wrecking appliances. In several instances these vessels have rendered important service in rescuing passengers upon the occasion of marine disasters within harbor limits.

THE FIRE-BOAT DETROITER

FIRE DEPARTMENT ITEMS

—The Fourth of July this year was unusually quiet as regards the number of fire alarms sent in in many cities. Boston ranks first with a total of twelve.

—A relief association is being organized at Omaha, Neb., for the members of the fire department. Membership is compulsory and a fund is to be provided from which sick and death benefits are to be paid.

—A committee of the Elizabeth, N. J., city council has favorably reported the organization of a paid fire department in place of the present volunteer force. It will cost $34,500 per year or $14,500 more than the one now in use.

—The following ordinance has been proposed for San Francisco, California, in place of that now in force: "The roofs of all buildings hereafter erected within the city and county of San Francisco shall be covered with either metal, tile, terra cotta, slate or asphaltum; if asphaltum, to be laid over felt and covered with at least three-quarters of an inch of gravel screened through a five-eighths-inch mesh and the asbestos to be used to weigh not less than fourteen pounds to 100 square feet, and gravel roofs shall not have a pitch of more than two inches to the foot." It was argued before the Fire Committee of the Board of Supervisors that it favored some at the expense of others and so action was deferred.

THE POLICE FORCES OF PHILIPPINE CITIES

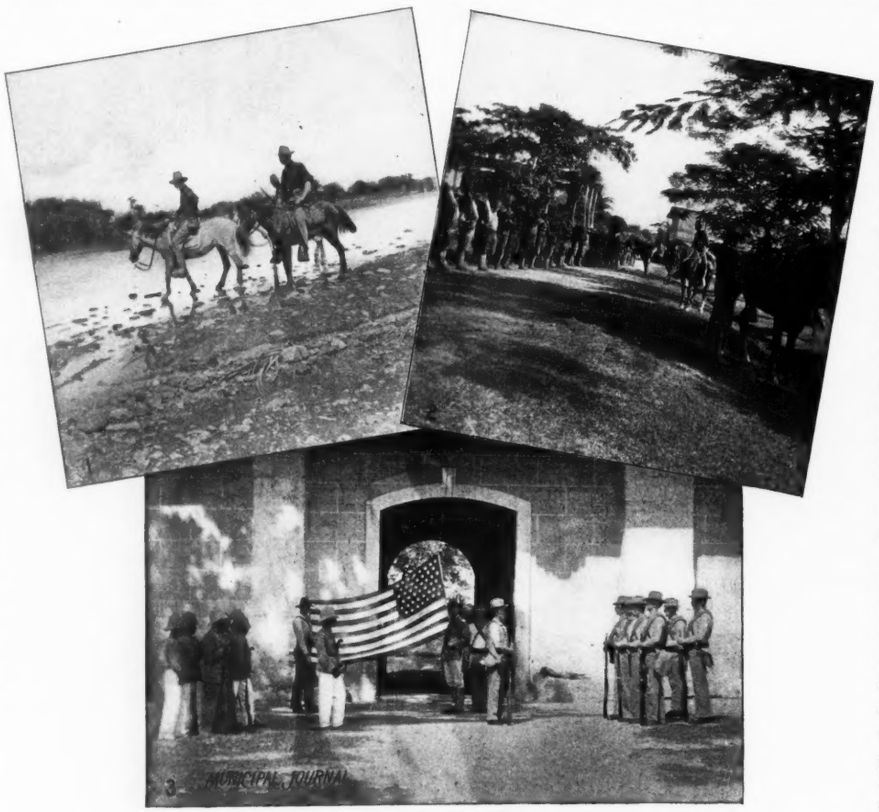
Every City Has a Police Department—Natives, Untrustworthy at First, Develop Into Efficient Patrolmen—Organization of Force from Volunteers—Detectives and Scouts Will Be Needed for Years to Come

By Our Special Correspondent

THE principal cities of the Philippines will soon be policed by well organized and equipped police forces, patterned after the metropolitan forces of the United States. As early as 1899 an effort was made by the military government to reorganize the native police forces. Since the work has been taken up by the commission progress has been more rapid, and at no distant day every city in the islands now under American control will be thoroughly policed by departments, the personnel of which will consist mostly of American soldiers who volunteered for this special service and who will be paid a good salary.

POOR EQUIPMENT OF THE NATIVE POLICE

In 1899 the only towns occupied by the Americans were Iloilo, Molo and Jaro. The native police forces of these places were composed of selected Filipinos, who were poorly equipped and drilled. Shortly after this about fifty other towns, mostly in the interior, were occupied by the military forces and in each one a similar organization was found. A town of 5,000 population would have about ten policemen, and a town of 40,000 forty. The forces were organized on the Spanish military company plan, with a chief or captain at the head, and a sergeant and corporals. In some towns most of the force was made up of officers.



1. MOUNTED POLICE ON SCOUTING DUTY. 2. MOUNTED POLICE ON DRESS PARADE. 3. FILIPINO POLICEMAN'S FIRST LESSON IN PATRIOTISM

The uniform of the native policemen, if it could be called such, was usually gray and much like that of the insurgents, so that our soldiers often mistook the native police for rebels. They were poorly paid, if paid at all, for while all members of the force were allowed a salary it was not always forthcoming, and many of them were not even able to supply themselves with food. The chief's salary was $10 per month with fees; the sergeant's, $6; the corporal's, $4; and the patrolmen's, $3.

NATIVE POLICE OFTEN USEFUL

The native policemen could often be relied upon to perform certain work, but it was found advisable to watch them closely at first, until we became better acquainted. They could not be relied upon to keep awake while upon patrol duty, but in all cases of riot, fire or other local disturbances they were found to be effective.

The equipment was not only meagre but crude. In most of the towns the forces were armed with shot guns, old revolvers, knives, spears, bolos, usually with one of the last three weapons named. The members of the forces were not drilled and knew nothing about discipline, either military or otherwise. The men were never known to salute a superior officer, and, as a consequence of the various lacks, the order maintained was of an inferior type.

AMERICANS INSTILL NEW LIFE INTO POLICE

With the arrival of the American soldiers came a new order of things. The shiftless air, the run down at the heel appearance, the untidy uniform, the lack of discipline all disappeared, and in their stead the native police were transformed into well equipped, fed, clothed and disciplined members of efficient departments. In each of the towns occupied by our soldiers, the commanding officer detailed one or more non-commissioned officers, or privates, to drill the native policemen in the manual of arms and in the necessary squad and platoon movements. These drills and the spirit of the army accomplished wonders in the general appearance of the native policemen, and they soon became efficient in all service demanded of them.

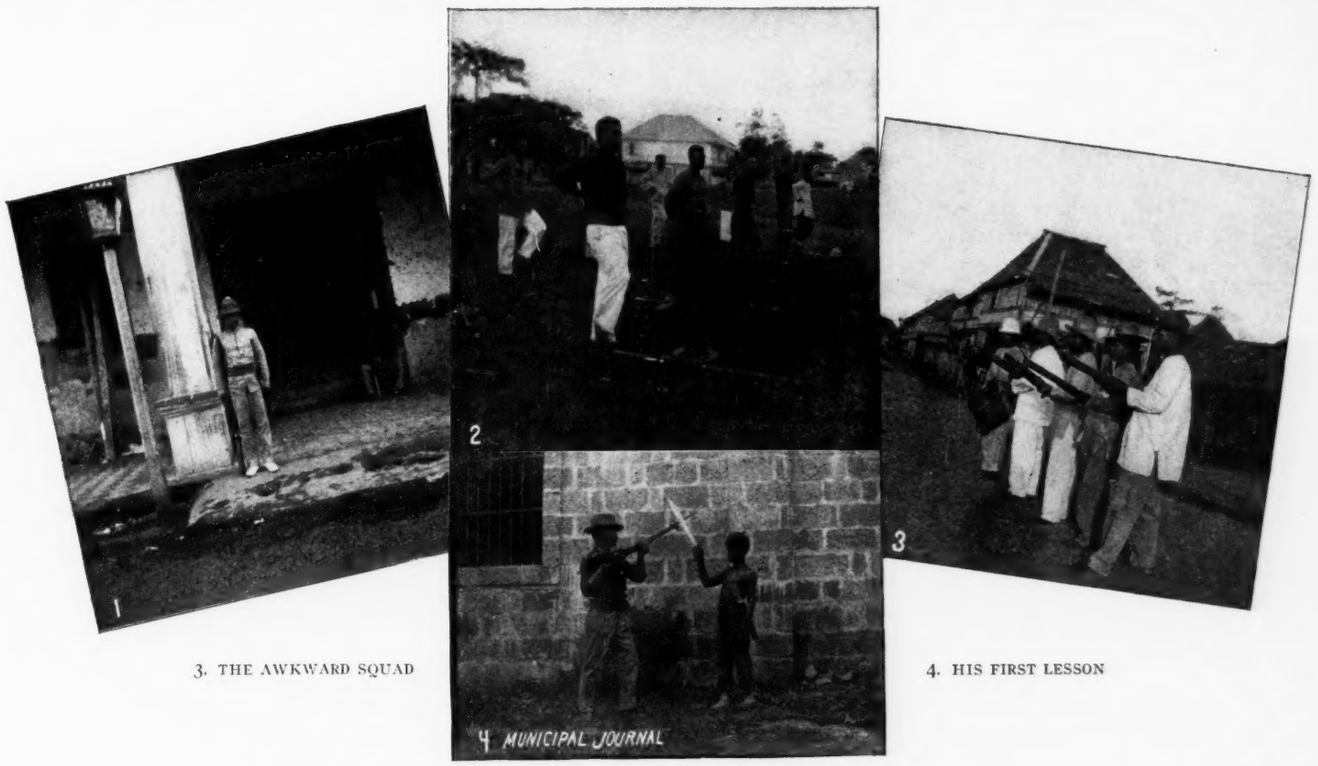
ILOILO HAS THE BEST FORCE IN PANAY

As might be expected the city of Iloilo has the best organized, equipped and most efficient force in the Island of Panay, where all native policeman have been employed by the Government for a long period of time. An American is at the head of the department, but the captains and lieutenants are selected from among the natives. The department numbers about one hundred men, including officers. At Jaro there are about eighty; Molo, fifty; and about six other cities with forty members in each department. These constitute most of the well organized and paid forces in the island. In addition to the regular force there are almost an equal number of volunteer policemen to be found in each city, who are to be called upon only in case of an emergency.

A detective force of some two hundred members is maintained, with headquarters at Iloilo, which operates throughout the island, employing many trusted natives, who have shown themselves thoroughly converted to the American cause. This force, like similar organizations in modern cities, wears no distinctive uniform, although there are secret marks, signs and salutes by which the members recognize each other under embarrassing circumstances.

THE PRIDE OF THE ISLANDS

But the pride of the Philippines is the new police force, which is now being organized. Its membership is made up from the ranks of the volunteers, two being selected from each company. There has



3. THE AWKWARD SQUAD

4. HIS FIRST LESSON

1. HEADQUARTERS AT MOLO, ISLAND OF PANAY 2. THE SETTING UP DRILL

CREATING A POLICE DEPARTMENT IN THE PHILIPPINES

been, from the first, a great desire to become one of the lucky two, with consequent rivalry among the men. Thus far all men have been chosen after passing a thorough physical and mental examination.

This organization is known as the Metropolitan Police Force of the Philippines, and is divided into three divisions—regular, detective and scouting. The officers at the head of each are selected from among the commissioned officers of the regular and volunteer army. The formation of the force, its equipment, discipline and regulations are patterned after the New York police department, with the exception that, in addition to a billy, each man is armed with a carbine, and a small revolver.

The khaki uniform, similar to that of the soldier, is worn, while the preference in hats is about equally divided between the helmet and the campaign hat. The salary is about the same as that paid to American policemen, and several times better than that paid to soldiers. For this, and other reasons the soldier likes police duty better than the life of a volunteer. In consequence, many discharged soldiers, whose time has expired, are staying in the Philippines, waiting their turn to get appointed to duty on the police force.

The scouts, although as a matter of fact, belonging to the army, form an important factor in the work of policing the islands. Each city has its quota of scouts, mounted on the swift native ponies, which, when kept in good condition, can cover a surprising extent of territory in twenty-four hours and endure a lot of rough riding. These are the men who are rapidly exterminating the roving bands of free-booters with which the islands, now under American control, are infested.

The trouble would soon be over if the average native, who is unacquainted with the Americans, could only disabuse his mind of the fallacy that Spanish methods are to be continued. A short acquaintance with Americans at close range is sufficient to convince the most obdurate native that he is fighting against friends and not enemies. As it is, it will require several years to bring about a peaceful state of affairs throughout the islands.

FIRE DEPARTMENT ITEMS

—Chief Croker, of the New York fire department, has decided not to use automobile hose wagons and has refused one for trial.

—Although Syracuse, N. Y., has had very few large fires in the last six months, small fires have been very numerous. There has been an average of one alarm a day, but the losses have been slight, as nearly all the alarms were for small fires in dwellings and stores.

—The New Haven, Conn., training school for the fire department has given great satisfaction. It has been decided to train the men in companies in place of in squads as formerly, however, because it is better to have them learn to work together in the companies in which they will be when fighting fires, and thus they will have confidence in one another when in action.

—On July 1st, the new state fire marshal law went into effect in Connecticut. It provides that the marshal and his deputy shall hold office for four years at salaries of $2,500 and $1,500 respectively. They shall not be connected with any insurance company, and the marshal shall be appointed by the governor.

—The manager of the Loroesch machine shops at Allegheny, Pa., Mr. J. E. Weaver, is building an electric fire engine of some 5,000 pounds. An electric motor takes the place of the boiler in the ordinary engine and is of fifteen horse-power. The inventor expects to secure his power from the trolley wires by throwing over them a wire with a hook on the end. His ultimate idea was to have electrical contrivances at the fire plugs, so the engine could be connected there.

—A serious fire recently occurred at Enid, O. T. The water supply gave out, and dynamite had to be used to blow down buildings to check the progress of the flames.

—A new heating apparatus that enables an engine to keep up fifty pounds of steam at all times and at very little expense has been perfected by J. C. Turbyfill, of the Birmingham, Ala., fire department.

—The members of the fire department of Green Bay, Wis., except the chief, have resigned. The men complained that they were underpaid; captains receiving only $45 per month, and the others $40. The action of the men left the town in a precarious position as regards protection from fire.

—The New England States Veteran Firemen's League has adopted a new set of rules for playing at contests. In place of hose they will use a 2½-inch iron pipe. The length has been cut down and instead of 250 feet as formerly, 200 feet will be used; 160 feet of iron pipe with a ten-foot length of fabric hose at the playing end and thirty feet at the engine end. Two public trials of this plan have given perfect satisfaction.

—Figures show that, notwithstanding the conflagration at Jacksonville in May, the fire loss of the United States and Canada for the first half of 1901 has greatly improved over the corresponding period in 1900. There was a decided reduction in the loss during the latter half of 1900, and this may be improved upon this year. The total losses for the first six months of 1900 were $103,298,900, and for the similar portion of 1901, $88,935,150.

—Chief Samuel C. Snaggs of the Waterbury, Conn., fire department, asserts that the storage battery, operating the fire-alarm telegraph in his department, cost the city but $1.86 per month for charging current, as against a cost of about $14.90 per month for chemicals and zincs for the old gravity battery before it was replaced. He also stated that the storage battery had not been touched in the way of repair or adjustment in all the three years or more that it has been in operation.

—Fire chiefs are requested to send the name of the party having charge of their fire telegraph system or instruct the said party to send his name to Frank P. Foster, secretary of the International Association of Municipal Electricians, Corning, N. Y., who will send them from time to time valuable information on this and other subjects. All electricians should have a copy of the proceedings of the next meeting of the association at Niagara Falls on September 2 to 4.

—The latest addition to the fire fighting apparatus of Pittsburg, Pa., shows that she keeps up to date in such matters. A combination water-tower, hose wagon and chemical engine has been purchased and it is claimed to be the only one of the kind in the country. It matches the big extra first-class automobile engine now in use, and is one of the most complete pieces of fire fighting apparatus made. The tower can be raised twenty-three feet and the chemical tank has a capacity of 100 gallons.

—Mayor Combe, of St. Joseph, Missouri, has been endeavoring for some time to have negroes appointed to the fire department. Each time the Assembly has refused to ratify the nomination, and as the names of the negroes were submitted with those of white men, all were rejected. The Mayor says he will try once more, and this time will present the names one at a time. It appears that, according to the statutes, the Mayor has nothing to do with the appointments and that this power rests entirely with the Municipal Assembly.

—For three years the Tenement House Commission of New York and ex-Chief Hugh Bonner have been investigating the tenement house fires. It has been found that forty-seven per cent. of all the fires in the city occur in tenement houses, although they form but thirty-five per cent. of all the buildings. Statistics show that of 7,943 tenement house fires, 7,614 were confined to the point of starting, while 329 extended through the whole building. About one-fourth of the fires went through lightshafts and one-fifth through halls and stairways, showing the great danger of the small narrow light shafts that act as flues for the fire.

—The fire department of Nashville, Tenn., is composed of eighty-five men, eight engines, three double tank chemical engines, nine hose carts and an aerial truck. Eleven fire halls in the city serve to house this apparatus. Last year there were 234 fires, but none were suffered to get beyond the building in which they originated. An exploit of which the department is very proud occurred last year. This consisted in responding to a call for help from Murfreesboro, thirty-two miles away. From the time the message was received, it took but one hour and three minutes to get the Mayor's permission, make ready the engine and cars, load the fire engine and horses on them and unload them at the other town.

—The State of Washington has just adopted a law establishing a State Fire Marshal. The chief of the fire department of every city and town and the chief of police and justices of the peace, where there is no organized fire department, shall be ex-officio deputy State fire marshals. They must ascertain the cause, origin and circumstances of every fire occurring within their districts within two days of its occurrence and report the same to the State Marshal, who must keep open to inspection a record of all the fires taking place in the State. When he considers it necessary, the State Marshal shall investigate any fire and if sufficient evidence be found to justify charging any one with the crime of arson, it shall be the duty of the said Marshal to furnish such evidence to the prosecuting attorney of the county in which the fire occurred, so that the guilty person may be brought to justice.

The Fire Marshal and his deputies shall have the power to enter and inspect any building where a fire has occurred, or in which there is reason to suspect that combustible materials dangerous to the safety of the building are stored.

The Deputy Fire Marshals are to receive $2.50 per day for the time actually spent in investigation.

NEW FIRE APPARATUS WANTED IN PATERSON

THE fire department of Paterson, according to the twenty-sixth annual report is in a great need of additional men, engines, horses and apparatus. Chief John Stagg calls attention to the fact of the long and continued use of much of the apparatus which is now in service. He maintains that much of it should be replaced with new apparatus, and that there should be an enlargement of the department in all directions. Accident and sickness threaten to materially cripple some companies, and the need for a larger force of members is imperative. The chief wants an increase which will allow an average of eight men to each company.

That the chief's recommendations are not unreasonable is shown by the fact that since 1891 the department has not been allowed any new apparatus, although the population has increased and the needs of the department been greatly enlarged. The engines now in service have been in commission without a break for periods ranging from ten to twenty years, and the various wagons from ten to fifteen years. The breakdowns are becoming more and more frequent, requiring retirement for repairs. For these reasons the chief advises the immediate purchase of two second class engines and two combination hose wagons.

The chief also recommends that all telephone, telegraph and electric light wires should be placed under ground in the business portion of the city, which would permit the removal of a danger which constantly menaces the life of firemen in the discharge of their duties. Besides, it would greatly improve the appearance of the streets to have the many poles removed.

During the year the department answered two hundred and thirty first bell, six second, seven third, one general, seventy-four telephone and one hundred and thirty-eight verbal alarms for fires, a total of four hundred and fifty-six alarms. The total loss for the year was $223,457, covered by an insurance of $2,048,061 with an insurance loss of $203,514.

GAS STATISTICS IN AMERICAN CITIES

Including Those Having a Population of 50,000 and Over

City.	Population of city.	Population of district supplied.	Annual output in million cu. ft.	Number of meters.	Price. Light. Gross.	Light. Net.	Fuel. Gross.	Fuel. Net.	Candle-power.	Per cent. sold for fuel.	Number public lamps.	Price per year.	Hours lighted per year.	Number public Welsbach lights
New York City, N. Y. (1)	3,437,202	125,000			$1.05	$1.00	$1.05	$1.00	24	35	1,800	* $24.00		
New York City, N. Y. (2)			16,000	489,455	1.05		1.05		23—28		14,000	* 17.50	4,000	4,000
New York City, N. Y. (3)			2,500	80,000	1.05				28	35	3,400	* 12.00	4,000	
New York City, N. Y. (4)					1.00	1.00	1.00	1.00	24					
New York City, N. Y. (5)		80,000	150	6,300	1.05	1.00	1.05	1.00	22	25	2,900	* 28.00	4,000	
New York City, N. Y. (6)					1.05				24—26		1,912	* 13.04	4,000	
Chicago, Ill. (1)	1,698,575		303	9,600		.90		.90	26	40				
Chicago, Ill. (2)		2,000,000	7,426	300,077	1.10	1.00	1.00		25	27	24,980	* 20.00	3,786	
Philadelphia, Pa. (1)	1,293,697	50,000	95	3,300	1.00	1.00	1.00	1.00			80	* 21.00	4,000	
Philadelphia, Pa (2)		1,500,000	5,100	177,118	1.00	1.00	1.00	1.00			20,094	Free.	4,278	
Brooklyn, N. Y. (1)	1,166,582	2,000,000	5,000	163,000	1.05	1.05	1.05	1.05	28		9,035	* 16.50	3,900	2,664
Brooklyn, N. Y. (2)		20,000	140	2,760	1.00		1.00		28	20	558	* 16.00	3,900	75
St. Louis, Mo. (1)	575,238	40,000	40		1.10	1.00	.90	.80	20	58	1,210	* 37.00	†	
St. Louis, Mo. (2)		575,238	1,200		1.10	1.00	.90	.80	22	39				
Boston, Mass. (1)	560,892	1,005			1.00		1.00							
Boston, Mass. (2)		167,257	1,085	29,337	1.00		1.00		18	40	632	|| 1.00	3,828	
Boston, Mass. (3)		20,000	738	25,305	1.00		1.00		18		3,419	12.00		
Boston, Mass. (4)		50,000	150	6,439	1.25	1.10	1.00		18				3,828	525
Boston, Mass (5)		84,061	205	10,543	1.00		1.00		18		2,201	|| 1.00	3,828	
Boston, Mass. (6)		44,000	58	2,679	1.50	1.40	1.50	1.40	18		359	|| 1 25	3,828	354
Boston, Mass. (7)		16,000	102	4,000	1.20	1.00	1.20	1.00	18				3,828	1,212
Boston, Mass. (8)		105,393	231	11,274	1.00		1.00		18		163	|| 1.00	3,828	
Boston, Mass. (9)		67,809	133	5,308	1.00		1.00		18		432	|| 1.00	3,828	
Baltimore, Md.	508,957	508,857	1,674	50,000	1.10	1.10	1.10	1.10	24		6,133		3,919	6,133
Cleveland, O. (1)	381,768	325,000	1,200	25,000	.75	.75	.75	.75	18	35	3,500	11.94	3,760	50
Cleveland, O. (2)		140,000			.75		.75							
Buffalo, N. Y. (1)	352,387	353,000	578	15,600	1.20	1.00	1.20	1.00	19	8	5,900	* 14.67	3,948	
Buffalo, N. Y. (2)					1.20	1.00	1.00							
San Francisco, Cal. (1)	342,782		246	3,750	1.00	1.00	1.00	1.00	19	20				
San Francisco, Cal. (2)		370,000	320	10,000	1.40	1.40	1.40	1.40	21	25				
San Francisco, Cal. (3)		28,804	900		1.40	1.40	1.40	1.40	23	37	4,513	‡ * .09	3,193	
Cincinnati, O.	325,902	340,000	3,819	30,000	.85	.75	.60	.50	18	12	2,300	13.25	3,819	1,200
Pittsburg, Pa. (1)	321,616	200,000	433	11,200	1.20	1.00			22					
Pittsburg, Pa. (2)		60,000	20	900	1.30	1.20	1.30	1.20	19.5		35	Avg. 14.41	4,000	
New Orleans, La.	287,104	289,000			2.50		1.50	1.25						
Detroit, Mich.	285,704	285,700	650	41,000	1.15	1.00	.90	.80	21	50				
Milwaukee, Wis.	285,315	290,000	1,100	46,000	1.20	1.00 to .80	1.00	.80 to .60	20	45	2,425	* 20.00	3,815	4
Washington, D. C.	278,718	278,718	1,135	29,600	1.25	1.10	1.25	1.10	25		6,460	* 20.00	3,579	160
Newark, N. J.	246,070	400,000	1,130	42,819	1.10	1.00	1.10	1.00	22	40	4,597	18.50	3,660	751
Jersey City, N. J.	206,433	365,000	975	48,313	1.10	1.10	1.10	1.10	25	20	1,329	Avg.* 23.75	3,500	274
Louisville, Ky. (1)	204,731	60,000	x 40	3,500			.55	.495		100				
Louisville, Ky. (2)		205,000	320	17,250	1.25	1.20	.80	.75	18	30				
Minneapolis, Minn	202,718	202,000		12,040	1.40	1.20	1.40	1.20	25		4,936	|| 1.00	1,800	
Providence, R. I.	175,597	225,000	708	28,183	1.10	1.10	1.10	1.10	19 to 20	40	784	1.05	All n't.	
Indianapolis, Ind.	169,164	200,000	260	y 26,919		1.00			18					
Kansas City, Mo.	163,752	180,000	800	21,120	1.10	1.00	1.10	1.00	24	50	2,117	* 12.00	†	
St. Paul, Minn.	163,065	163,000	320	8,500	1.50	1.30	1.50	1.30	23	25	2,600	* 23.00	4,000	74
Toledo, O.	131,822	70,000	250	9,000	1.10	.95		.70	20	25				
Allegheny, Pa.	129,896		200	y 7,362	1.20	1.00			22					
Columbus, O.	125,560	125,000	185	5,618	1.10	1.00	1.10	1.00	19	1				
Worcester, Mass.	118,421	110,000	275	9,566	1.20	1.00	1.20	1.00	20.5		509	|| 1.10	3,900	479
Syracuse, N. Y.	108,374	110,000	210	13,026	1.50	1.30	1.00		19	33				
New Haven, Conn.	108,027	108,000	380	17,000	1.10	1.00	1.10	1.00	21	33	946	* 22.00	4,000	431
Paterson, N. J.	105,171	150,000	333	14,280	1.25	1.15	1.25	1.15	24 to 26	30	529	17 to 18	4,000	
Fall River, Mass.	104,863	104,000	190	8,557	1.25	1.15	1.25	1.15	24		110	.75 1 hr.		
St. Joseph, Mo.	102,979	102,900	170	5,500	1.25	1.00	1.25	1.00	20					
Omaha, Neb.	102,555	128,300	285	9,755	1.45	1.35 to 1.15			25	48	952	* 30.00	4,000	952
Los Angeles, Cal.	102,479	103,000	191	7,435	1.50	1.50	1.50	1.50	20	40				
Memphis, Tenn.	102,320		170	6,000	1.40		1.15		20	35				
Lowell, Mass.	94,969	95,000	348	12,711	1.20	1.00	1.20	1.00	20.6		1,051	6.78	1,696	
Albany, N. Y.	94,151	100,000	32			1.50		1.25	26	15				
Cambridge, Mass.	91,886	125,000	300	13,442	1.20	1.00	1.00		18		3,850	|| 1.20		336
Portland, Ore.	90,426	70,000	60	2,600	2.50	2.12	1.65		18 to 22	15				
Atlanta, Ga.	89,872	100,000	300	8,350	1.10	1.00	1.10	1.00	21	40				
Grand Rapids, Mich.	87,565	87,565	320	10,900	1.20	1.00 to .80	1.20	1.00 to .80	20	40				
Dayton, O.	85,333	87,000			1.00	.85			21		1,222	* 16.50	3,764	
z Richmond, Va.	85,050		260	7,057	1.00	1.00	1.00	1.00	22.5			* 18.00	12 hrs. n't.	146
Nashville, Tenn.	80,865	130,000	165	6,000	1.10	1.00	1.10	1.00	16	40	520	|| 1.00	†	
Seattle, Wash.	80,671	50,000	110	5,150	2.00	1.50	2.00	1.50	18	35	140	|* 2.00	4,400	
Hartford, Conn.	79,850	82,000	250	11,000	1.10	1.00	1.10	1.00	22	35				
Reading, Pa.	78,961	67,500	105	9,099	1.50	1.35	1.50	1.35	24—26	30	430	* 30.50	4,000	430
Wilmington, Del.	76,508	76,556	230	8,046	1.10	1.00	1.10	1.00	20.3	28	517	* 16.62	3,650	6
Camden, N. J.	75,935	70,000	182		1.00				20		484	* 21.00	4,000	185
Trenton, N. J.	73,307	75,000	220	6,000	1.00		1.00		21		276	* 30.00	All n't.	276
Bridgeport, Conn. (1)	70,996	73,000		5,000	1.50	1.25	1.25		20		132	13.00	4,000	132
Bridgeport, Conn. (2)		40,000	200	1,100			.25 to .50			100				
Lynn, Mass.	68,513	75,000	200	7,306	1.20	1.00	1.20	1.00	19.5	25				
Oakland, Cal.	66,960	100,000	160	12,000	1.50		1.25		22.5	30				
Lawrence, Mass.	62,559	76,000	150	5,084	1.10	1.00	1.10	1.00	20	30	9	* 15.00	2,200	
New Bedford, Mass.	62,442	40,000	84	3,863	1.40	1.12	1.40	1.12	19	33	647	‡ * .065	3,157	
Des Moines, Ia.	62,139	50,000	150	6,400	1.30	1.20	1.30	1.20	24	50	710	* 17.00	3,000	72
Springfield, Mass.	62,059	70,000	172	8,173	1.20	1.05	1.20	1.05	20					
Troy, N. Y.	60,651	80,000	175	7,000	1.50		1.25		25	35	250	* ‡ .075	3,760	
Evansville, Ind.	59,007	60,000	100	5,000		1.00		.90	18	20	425	* 18.00	4,000	423
Manchester, N. H.	56,987	56,987	98	5,050	1.40	1.25	1.40	1.25	20	25	63		4,000	63
Utica, N. Y.	56,383	60,000	90	3,800		1.50	1.50 to 1.00		24	20				
Peoria, Ill. (1)	56,100	60,000	60	2,000	1.25	1.15	.85	.75	18 to 19	50				
Peoria, Ill. (2)		56,100	100			1.00		1.00	22	25				
Charleston, S. C.	55,807	56,000	105	3,200	1.60		1.20		18	14	863	* 16.38	4,000	6
Savannah, Ga.	54,244	54,244	100	4,358	1.50	1.40	1.50	1.40	25	40				
Salt Lake City, Utah	53,531	90,000	72		1.90	1.71	1.40	1.26						
San Antonio, Tex.	53,321	35,000	17	600	1.50	1.25	1.50	1.25	18	70				
z Duluth, Minn.	52,969	30,000	36	1,691	1.35	1.25 to 1.15	1.25	1.00	20	43				
Erie, Pa.	52,733	60,000	47	1,400	1.10	1.00		.60	21	10	641	* 16.00	4,000	641
Elizabeth, N. J.	52,130	53,000	108	3,900	1.50	1.25	1.50	1.25	20		900	* 14.00	4,000	
Kansas City, Kan.	51,418	51,418	74	3,217	1.10	1.00	1.10	1.00	25	65	53	* 16.00	2,270	
Harrisburg, Pa.	50,167	50,000	75	6,538	1.70	1.60	1.35	1.25	25	29				

* Includes repairs, care, lighting and extinguishing. † Lighted by moon scale. || Per 1,000 feet ‡ Price per night. x Natural, 350,000,000. y Number of consumers. z Municipal. § To 12 M. ¶ Per year.

Price of all gas in Greater New York for 1901 is $1. (From Brown's Directory of American Gas Companies. By courtesy of the publisher.)

MUNICIPAL MATTERS DETERMINED IN COURT

TROLLEY ROADBED REAL ESTATE

THE Supreme Court of New Jersey has decided that the roadbed, rails, poles, stringers and wires of trolley lines, occupying the public streets or highways, are real estate, and as such are taxable. The decision is a radical departure from the usual way in which New Jersey treats her corporations.

COMPANIES MUST SUPPLY WATER

THE Circuit Court at Urbana, Ohio, has confirmed the Court of Common Pleas in its decision that a water works company is a quasi-public corporation, and that, as long as it uses the streets for its pipes, it cannot refuse to supply the city with water for fire protection, even if no contract exists.

ELEVATOR NOT A COMMON CARRIER

THE Supreme Court of Massachusetts has held that a passenger elevator in an office building is not a common carrier within the meaning of the Statutes. The Court holds that the owner of the elevator, or his agent, has the right to refuse to carry any passenger without any liability to himself, and thus does not come under the head of a common carrier.

BLOCKS MUNICIPAL OWNERSHIP

IN the Circuit Court in Joliet, Ill., a decision has been handed down sustaining an injunction enjoining the city from issuing $24,000 water certificates for a water-works system, on the ground that the indebtedness would exceed the 5 per cent. limit. The city wished to bring the issue under the Wood law, but the Court held that the law did not allow a city to exceed the 5 per cent. limit.

MACADAMIZING NOT PAVING

IT has been decided in Maryland that, in order to use the streets when an ordinance has been passed to permit of such by a railway company, the said company must construct its tracks and commence running its cars within a specified time after permission is given. If, however, the streets are not "graded and paved" the time is extended. It was further held that macadamizing is not paving within the meaning of the ordinance.

EXCISE BOARD LAW UNCONSTITUTIONAL

THE Court of Errors and Appeals of the State of New Jersey has declared unconstitutional the act of the last Legislature providing for the election of excise boards in Newark and Jersey City. The act established a bi-partisan board, composed of two members appointed by each of the two large political parties. The Court holds that every voter has the right to vote for every candidate to be elected, and that this act defeats this right and is therefore unconstitutional.

UNDERGROUND WATER RIGHTS OF A CITY

THE Court of Appeals of the State of New York has ruled that the city of Brooklyn has no right to pump underground water from the land of another by means of wells, or otherwise, and such an action is a trespass. This decision is of great importance to the city mentioned, as its water supply has been running low for some years, and the supply has been added to by driven wells. Based upon this decision, many suits were immediately brought by farmers of Long Island to recover supposed damages from the draining of the water from the soil on their farms. As was shown at the trial, the water which supplied the wells came from the water table from fifty to 100 feet below the surface, and that the water that supplied the top soil was from rain fall entirely. Consequently, the lowering of the lower water table had no effect on the crops, for the surface is not moistened by the underground water, either by direct contact or by capillary attraction. However, in view of the above decision of the Court of Appeals, decision had to be rendered the plaintiffs, but the damages awarded were only nominal.

CITY CONTROL OF RAILWAY TRACKS

THE city of New Orleans has the power to authorize the laying of a third rail by a railway company when a re-arrangement of the tracks is being made and the street is being paved. The question of the company laying the rail having the right to use the same is involved in litigation. Street railways do not own the street soil upon which they place their tracks, and their ownership of the tracks themselves is subject to the right of the city to authorize other roads to use such tracks.

CREEK NOT A SEWER

JUDGE ANDREWS, of the Supreme Court of New York, has issued a permanent injunction against the city of Syracuse forbidding the city to empty sewage into a creek near to the plaintiffs' property. A proposed sewer, which was to open into the creek near to the plaintiffs' property and which would further pollute the stream, cannot be built. The Court finds that the plaintiffs are riparian owners upon the stream, and they are clearly entitled to the prevention of its pollution. The fact that the injury to the property is slight is no answer to their claim, nor is it material that the stream is artificial.

CONTRIBUTORY NEGLIGENCE

THE Supreme Court of Indiana in a recent case held that where a person was injured in a street where she had a right to be, the fact that she might have gone on another part of the street and avoided injury did not necessarily establish negligence. Where a person approached a street crossing on a bicycle so that the nearest engine was a block away and she could not see anything to indicate danger she was not negligent in riding near the end of a car which projected into the street, although another car, set in motion by the said engine, was approaching the train of cars of which the said car was one so as to strike it and set it in motion just as she passed the end of it.

UNILATERAL WATER CONTRACTS

THE Supreme Court of Indiana in the case of Jordan et al. vs. the Indianapolis Water Company, has decided that if a contract is unilateral so that its covenants are not mutual, it cannot be enforced by the party it does not assume to bind against the one it does, unless the defendant has already had the benefit of the consideration for his agreement. Where a water company contracted to furnish water from its canal in repair, and to do nothing at all except in event of its having surplus water not required for any other purpose, it cannot, by showing that it had surplus water at a season when the ice pond might have been flooded, enforce payment for water that the defendant did not draw out of the canal nor use for that purpose. To enforce a contract of which he received no benefit against one who could not have compelled the other party to grant him any benefit thereof would be unconscionable.

CITY CANNOT FIX GAS RATES

IN Indiana it has been held recently that when an ordinance has been passed allowing a gas company to lay its pipes to supply the inhabitants and prescribing a schedule of maximum rates for the same, and the company accepted the ordinance, the said ordinance constituted a binding contract on the part of both city and company as to fixing the price of the gas. As the former franchise of the company allowed it to fix its own charges for its gas, and its acceptance of the ordinance was with the express condition that none of its vested rights under former franchises should in any way be affected thereby, the company retained its rights to fix the price of gas except as regulated by the ordinance accepted.

And it was further held that the city had no right to fix a maximum rate of charges when the company, under a former franchise, had no limit set to its charges and when there was no evidence to show that the rates of the company were other than reasonable.

MUNICIPAL BOND SALES FOR JULY

Aggregate Nearly $20,000,000—Largest July Sale in Five Years—Interesting Statistics

THE sale of municipal bonds for the month of July has been unusually large, the aggregate amounting to nearly $20,000,000, which places the monthly average well ahead of any previous record during the past five years for the corresponding period. The sales for July amounted to more than twice as much as for the same period in 1900. This is the only striking feature incident to the movement in municipals during the month. Most of the issues have been small. There has been no sensational failure similar to that of Philadelphia in June, to float any bond issue of importance.

Although the sale of municipal bonds was phenomenal during the year 1900, the MUNICIPAL JOURNAL AND ENGINEER predicted at the beginning of the year that even that record would be broken in 1901. During the first seven months of this year the aggregate sales have amounted to well on to $120,000,000, which is largely in excess of the aggregate for the same period last year. From present indications this pace is likely to be maintained for the balance of the year, and, if it is, the grand total will not be far from the $200,000,000 mark, which will be the greatest ever known.

The attention of our readers is called to the accompanying table, which shows that the prevailing rate of interest, even for small municipalities, seldom gets above 4 per cent. There are a few at 5 per cent.. still less at 6 per cent., and none at more than 6 per cent. Many of the short term issues have brought a premium, and, almost without exception, the long term 3 per cents. have sold at a good figure. It is a good time to dispose of municipals.

PURCHASER.	PURCHASE.	INT. RATE.	TERM, YEARS.	AMOUNT.	PRICE.
Ames, A. E., & Co., Toronto	Brockville, Ont., Water Works 4	per cent. a.	30	$26,547.30	100.600
Ames, A. E., & Co., Toronto	Brockville, Ont., Local Improvements 4	per cent. a.	20	22,718.30	100.600
W. J. Hayes & Sons, Cleveland	Colorado Springs, Colo., City Hall, Gold 4	per cent. s. a.	10—15 Opt.	118,000.00	103.170
Farson, Leach & Co., New York	Schenectady, N. Y., Sewer 4	per cent. s. a.	27 Avg.	30,000.00	104.380
McDonald, McCoy & Co., Chicago	Peoria, Ill., Park District Improvement 3½	per cent. s. a.	20	50,000.00	100.000
Gavin, Jos. E., Buffalo	Syracuse, N. Y., Columbus Park 3½	per cent. s. a.	1—5 Ser.	50,000.00	102.295
	Syracuse, N. Y., School 3½	per cent. s. a.	1—20 Ser.	50,000.00	102.188
Farson, Leach & Co., New York	Syracuse, N. Y., Library 3½	per cent. s. a.	1—20 Ser.	38,000.00	102.188
Harris, N. W. & Co., New York	Syracuse, N. Y., Fire Engine House 3½	per cent. s. a.	1—20 Ser.	35,000.00	102.188
	Syracuse, N. Y., Round Top Park 3½	per cent. s. a.	1—20 Ser.	25,000.00	102.188
	Syracuse, N. Y., Hook and Ladder House 3½	per cent. s. a.	1—20 Ser.	7,000.00	102.188
Kleybolte, Rudolph, & Co., Cincinnati	Canton, O., Street Improvement 4	per cent. s. a.	1—5 Ser.	47,300.00	101 001
Sinking Fund Trustees	Burlington, Vt., Street Improvement 3½	per cent. s. a.	20	30,000.00	Par.
White, Geo. C., Jr., New York	Watkins, N. Y., Water and Sewer 4	per cent. s. a.		20,000.00	110.570
Hanson Bros., Montreal	Winnepeg, Man., City 4	per cent.	20	200,000.00	99.060
Brandt, John, Local	Murdock, Mich., Elec. Lgt. and Water Works 6	per cent. a.	15	1,500.00	103.400
Dollar Saving & Trust Co., Local	Youngstown, O., Sewer 5	per cent. s. a.	5¾ Avg.	12,000.00	107.766
Local Banks	Newport, N. H., Water 3	per cent. s. a.	8—20 Opt.	20,000.00	103.500
Local Banks	Newport, N. H., Sewer 3	per cent. s. a.	10—19½ Opt.	3,800.00	103.250
Mason, Lewis & Co., Chicago	San Diego, Cal., Water 4½	per cent. s. a.	1—40 Ser.	600,000.00	104.370
Rogers, Newman & Tolman, Boston	Malden, Mass., City 3½	per cent. s. a.	9—11½ Avg.	58,000.00	102.640
Rogers, Newman & Tolman, Boston	Salem, Mass., Water 3¼	per cent. s. a.	1—10 Ser.	15,000.00	100.253
Second National Bank, Local	Toledo, O., Street Improvement 4	per cent. s. a.	1—5 Ser.	100,893.00	101.199
State Savings Bank, Toledo	Holgate, O., Water and Electric Light 5	per cent. s. a.	10¾ Avg.	15,000.00	108.843
Feder, Holtzman & Co., Cincinnati	London, O., Electric Light Plant 5	per cent. s. a.	1½—4½ Ser.	5,000.00	102.760
Firemen's Pension Fund	Akron, O., Sewer 5	per cent. s. a.	2 Avg.	7,200.00	102.180
First National Bank, Paw Paw	Decatur, Mich., Improvement 5	per cent. s. a.	1—10 Ser.	5,000.00	104.390
Harris, N. W., & Co., Chicago	Wahpeton, N. D., Funding 4½	per cent.	20	23,000.00	100.500
Local	Franklin, N. H., Refunding Water Works 3½	per cent. s. a.	20	20,500.00	107.480
McNeal, J. W., Local	Guthrie, Okla., Sewer 4½	per cent.	20—30 Opt.	65,000.00	100.208
McNeal, J. W., Local	Guthrie, Okla., Water Works 4½	per cent	20—30 Opt.	30,000.00	100.208
McNeal, J. W., Local	Guthrie, Okla., City Building 4½	per cent.	20—30 Opt.	25,000.00	100.208
Seasongood & Mayer, Cincinnati	Lexington, N. C., School 5	per cent. s. a.	30	4,000.00	103.750
Sherrill, I. W., Poughkeepsie	Cohoes, N. Y., School 3½	per cent. s. a.	25	40,000.00	105.043
Adams & Co., Boston	Bay City, Mich., Local Improvement 4	per cent. s a.	3—5 Ser.	49,500.00	102.050
Canadian Bank of Commerce	Berlin, Ont., Local Improvement 4	per cent. s. a.		9,899.00	100.608
Central Canada Loan & Savings Co.	Winnipeg, Man., City 4	per cent.	20	83,721.00	98.100
Cincinnati Trust Co., Cincinnati	Glendale, O., School 4½	per cent. s. a.	24½ Avg.	2,000.00	101.370
Coffin, Chas. H., Chicago	Rosedale, Miss., Town 6	per cent a.	20—30 Opt.	4,000.00	102.500
Croghan Bank, Fremont	Lima, O., Grading Grand Ave 5	per cent. s. a.	1¼ Avg.	1,000.00	101.350
Croghan Bank, Fremont	Lima, O., Grading W Elm St 4½	per cent. s. a.	1 1-6 Avg.	4,200.00	100.619
Davis, Z. D.	Brookhaven, Miss., School 5	per cent. s. a.	5—20 Opt.	13,500.00	104.500
Denison, Prior & Co., Boston	Putnam, Conn., Street 3½	per cent.	28	10,000.00	105.000
Duval & Percival	Butler, Mo., Electric Light Plant 4	per cent. s. a.	7½—20 Opt.-Avg.	19,000.00	101.060
Estabrook & Co., Boston	Lynn, Mass., Water 3½	per cent. s. a.	30	25,000.00	106.789
Gowaan, C. C., & Co., Grand Forks	Park River, N. D., Electric Light and Water 5	per cent. a.	20	19,800.00	103.610
Hanson Bros., Montreal	Winnipeg, Man., City 4	per cent.	30	200,000.00	99.060
Local	Nashville, Tenn., Electric Light Plant 4	per cent. s. a.	14½—29½ Opt.	7,000.00	109.500
New First National Bank, Col	Cambridge, O., Street Paving and Sewerage 4	per cent. s. a.	25	19,000.00	106.780
Second Ward Savings Bank, Local	Milwaukee, Wis., Bridge 3½	per cent. s. a.	1—20 Ser.	100,000.00	102.250
Stoddard, Nye & Co., Minn	Alexandria, Minn., Sewer 4½	per cent. s. a.	5	6,000.00	100.525
Third National Bank, Piqua	Bradford, O., Electric Light 5	per cent. s. a.	6 Avg.	5,745.00	101.753
Van Wert National Bank	Van Wert, O., Street Improvement 5	per cent. s. a.	4 2-3 Avg.	6,700.00	106.716
Blodget, Merritt & Co, Boston	Syracuse, N. Y., Columbus Park 3½	per cent. s. a.	5	50,000.00	100.360
Blodget, Merritt & Co, Boston	Syracuse, N. Y., Local Improvement 4	per cent. s. a.	9	49,500.00	102.660
Estabrook & Co., Boston	Fall River, Mass., Sewer 3½	per cent	30	20,000.00	105.579
Estabrook & Co., Boston	Fall River, Mass., Highway 3½	per cent.	10	30,000.00	102.188
Delray Savings Bank	Springwells, Mich., School 4	per cent. s. a.	10	12,000.00	104.580
Finn, Matthew, Detroit	Ithica, Mich., Sewer 4	per cent. s. a.	5—19 Ser.	15,000.00	101.783
German American & Citizens Bank	Sidney, O., Sewer 3½	per cent. s a.	25	50,000.00	Par.
German National Bank, Cincinnati	Carthage, O., Street Improvement 5	per cent. s. a.	1—10 Ser.	1,765.00	104.499
Hayes, W. J., & Sons, Cleveland	Troy, N. Y., Water Works 3½	per cent. s. a.	13.2½ Avg.	135,000.00	100.740
Mutual Loan Association, Local	Conneaut, O., School 4	per cent. s. a.	1—20 Ser.	27,000.00	103.875
People's Trust Co., Local	St. Albans, Vt., School, Gold 3½	per cent.	1—4 Ser.	9,000.00	100.010
Rogers, Newman & Tolman, Boston	Everett, Mass., Notes 4	per cent s. a.	1—7 Ser.	4,200.00	102.420
Scranton Savings Bank	Dalton, Pa., School 4½	per cent.	30 Opt.	5,000.00	102.000
Sinking Fund	Everett, Mass., Sewer 4	per cent. s. a.	30	25,000.00	118.250
Springfield Savings Bank	Springfield, O., Clifton Street Improvement 6	per cent. s. a.	1—10 Ser.	27,655.00	111.968
Stafford, F. M., & Co., Chattanooga	Rockingham, N. C., Electric Light 6	per cent s. a.	30	18,000.00	112.736
Kleybolte, Rudolph, & Co., New York	Mt. Vernon, N. Y., School 3½	per cent. s. a.	30	30,000.00	101.520
Hayes, W. J., & Sons, Cleveland	Norway, Mich, Electric Light 6	per cent. a.	8 Avg.	25,000.00	109.160
McDonald, McCoy & Co., Chicago	Omaha, Neb., School 4	per cent. s. a.	19½	40,000.00	104.420
Seasongood & Mayer, Cincinnati	Bellevue, O., Public Hall 4	per cent. s. a.	28½	10,000.00	104.280
Denison, Prior & Co., Cleveland	Cleveland, O., Sewer District 4	per cent s. a.	11	63,000.00	106.560
Jefferson Co. Savings Bank, Watertown, N. Y	Copenhagen, N. Y., Village 3½	per cent. s. a.	5—30 Ser.	18,980.00	102.000
Adams & Co., Boston	Haverhill, Mass., City, Coupon 3½	per cent. A. & O.	9 2-3	35,000.00	102.310
Commercial Savings Bank	Racine, Wis., School 3½	per cent. s. a.	11½ Avg.	50,000.00	100.700
Farmer's Bank, Georgetown	Lewes, Del., Water Works and Electric Light 4	per cent. s a.	20—40 Avg.	50,000.00	103.000
Firemen's Pension Fund	Akron, O., Washington Street Sewer 5	per cent. s. a.	1—3 Ser.	2,000.00	102 250
Firemen's Pension Fund	Akron, O., Kolb Street Sewer 5	per cent. s. a.	1—5 Ser.	1,500.00	102.933
Harrison, A. W	Owen Sound, Ont., Water Works 4	per cent. J. & J.	30	30,000.00	101.250
Police Pension Fund	Akron, O., Fountain Street Sewer 5	per cent. s. a.	1—3 Ser.	900.00	101.444
Second National Bank, Local	Hamilton, Ont., Storm Sewer 4	per cent. J. & J.	8	3,800.00	100.326
Second National Bank, Local	Hamilton, O., Sanitary 4	per cent. J. & J.	5½ Avg.	3,700.00	100.326
Smith, Charles, Local	Albion, Ill., Water 6	per cent. a.	1—4 Ser.	300.00	102.500
State Bank of Norway	Norway, Mich, Water Works Extension 6	per cent. a.	1—12 Ser.	6,000.00	107.918
Allen, Sand & Co., New York	Yonkers, N. Y., School 3½	per cent. s. a.	21 2-3 Avg.	30,000.00	103.410
Stein, M. A., New York	Yonkers, N. Y., Fire Department 4	per cent.	9 5-6 Avg.	12,000.00	100.290
New First National Bank, Columbus	Elyria, O., Water Works Improvement 4	per cent. s. a.	14 Avg.	150,000.00	104.320

COMPARATIVE BIDS FOR CONSTRUCTION WORK

PUMPING ENGINES

CINCINNATI, O.—Bids for pumping engines were received by the Commissioners of Water Works as follows:

	3 25-mil. gal. engines.	3 12-mil. gal. engines.	Electric crane.
Allis-Chalmers Co., Milwaukee, Wis.	$478,000 448,000 453,000 423,000	$489,000 458,000	$10,000
Camden Iron Works, Camden, N. J.	533,000	527,000	10,700
Holly Mfg. Co., Lockport, N. Y.	410,500	391,000	11,000
Kilby Mfg. Co., Cleveland, O.	587,500 610,900	593,500 615,900	7,000
Laidlaw-Dunn-Gordon Co., Cincinnati, O.	416,500	397,900	11,000

SEWERS

BROOKLYN, N. Y.—Bids were received for the great sewer as follows:

Borough Contracting Co.	$773,227.50
Farrell & Hopper	1,211,356.50
Cream & Cranford	812,966.65
Norton, Kirk & Co.	837,852.50
Cunningham Kearns	1,016,591.50

PORTLAND, ME.—Bids for sewers were submitted as follows:

	R. D. Strannahan.	D. F. Griffin & Bro.	J. J. Mahoney.
Earth excavation, 6,320 cu. yds.	$1.12½	$1.20	$1.35
Brick, 700 cu. yds.	4.25	5.25	4.75
Concrete, 850 cu. yds.	4.00	5.00	4.40
Pipe, 8 to 15-in., 850 feet	.15	.40	.35
Pipe, 18 to 30-in., 700 feet	.30	.30	.60
Total	$13,823	$16,059	$16,315

ASPHALT PAVING

HAVANA, CUBA.—Recent bids for street paving were as follows:

		Estimated cost.	Onderdonk, Maclennen & Dady.
Concrete for foundation	93,000 cu. meters.	$8.64	$14.00
Sheet asphalt paving	197,726 sq. meters.	1.925	4.00
Granite curbing with sand bed (standard)	42,000 lin. meters.	4.504	6.95
Old curb reset on sand	50,000 lin. meters.	.456	.55
Curbing (bluestone), with bed	42,000 lin. meters.	3.352	5.60
Block asphalt	197,725 sq. meters.	4.0125	5.45
Subgrade prepared	933,402 sq. meters.	.14	.23

ASPHALT PAVING

SEATTLE, WASH.—Bids for laying asphalt pavement in Terry avenue:

	Stirrat & Goetz.	City Improvement Co.	Alcatraz Asphalt Co.	Trinidad Asphalt Co.	San Francisco Pav. Co
Subgrading, 16,000 cu. yds.	$.35	$.35	$.30	$.35	$.30
6-in. pipe sewer, 1,000 lin. ft.	.80	.65	.37	1.00	.60
8-in. pipe sewer, 720 lin. ft.	1.00	.70	.48	1.25	.70
4½-ft. manholes, 14 each	60.00	40.00	58.00	100.00	60.00
Curb, concrete, 22,800 lin. ft.	14.00	20.00	.37	.50	.50
Brick gutters, etc., 8,400 sq. yds.	2.75	3.05	2.60	2.80	3.00
Cement walks, 200 sq. yds.	35.00	33.00	1.21	1.25	1.35
Tile drain, 20,000 lin. ft.	1.90	2.61	.08	.16	.10
Single inlets, 55 each	45.00	52.00	52.50	65.00	23.00
Double inlets, 16 each	.10	.095	63.00	80.00	45.00
Asphalt pavement, 31,800 sq. yds.	.50	.55	2.27	2.25	2.15
Stops, wood, 1,100 lin. ft.	.50	.25	.50	.48	1.15
Lumber for repairs, sidewalk, 20,000 ft.	1.25	1.35	13.85	25.00	20.00
Fixed estimate, abstract title, etc.	5,000.00	5,000.00	5,000.00	5,000.00	5,000.00
Cleaning, etc.	1,000.00	300.00	1,225.00	700.00	1,500.00
Total	$114,605.00	$139,264.00	$121,570.00	$130,403.00	$124,134.00
Maintenance, 10 yrs., per sq. yd.	$.02	$.05	$.028	$.035	....

ASPHALT AND BRICK

SYRACUSE, N. Y.—The following contracts for paving were let recently by the Board of Contract and Supply:

Gifford St. (S. Clinton to S. Geddes Sts.), asphalt	$41,055.00	Warner Quinlan Asphalt Co.
Harrison St. (University Ave. to Walnut Pl.), asphalt	3,115.50	Empire Contracting Co.
Leavenworth Ave. (Park to Belden Ave.), asphalt	6,819.10	Empire Contracting Co.
Lincoln Ave. (Tallmain to Bellevue Aves.), asphalt	8,265.50	Warner Quinlan Asphalt Co.
North Alvord St. (Danforth to N. Salina Sts.), asphalt	3,456.85	Empire Contracting Co.
South Warren St. (E. Genesee to E. Washington Sts.), asphalt	1,101.80	Barber Asphalt Paving Co.
Pearl St. (Canal to Willow St.)	5,719.50	F. J. Baker & Co.
Euclid Ave. (College Pl. to Westcott St.), brick	33,553.50	Gleason-Kiely Contracting Co.
Wallace St. (Noxon to Mechanic St.), brick	9,364.00	F. J. Baker & Co.
Belden Ave. (N. Salina to Pearl Sts.)	8,706.20	F. J. Baker & Co.
Wallace St. (Belden Ave. to Noxon St.)	21,118.00	F. J. Baker & Co.
West Jefferson St. (S. Clinton to S. West Sts.), brick	9,018.00	F. J. Baker & Co.
West Fayette St. (S. West St. to Niagara St.), brick	19,455.00	F. J. Baker & Co.

BRICK SEWERS

PITTSFIELD, MASS.—Bids were received for constructing sewers as follows:

	Dodge & Devanny.	Maloney & Peterson.	Geo. N. Atkins.	D. O'Connel & Son.	F. L. Allen.
21 x 36-in. brick sewer, 210 ft.	$3.75	$6.00	$3.00	$3.25	$5.50
18 x 27-in. brick sewer, 100 ft.	4.50	5.50	2.40	3.00	4.00
Construction of reservoirs	59,400.00	50,340.00	55,753.00	59,380.00	67,300.00

SEWERS

SYRACUSE, N. Y.—The following bids were received for sewers:

Manlius street (18-inch pipe)	$2,668.00	Gleason-Kieby Contracting Co.
Harbor street (24-inch pipe)	4,360.20	Martin Lavelle.
Chemung street (18 inch pipe)	653.55	Gleason-Kieby Contracting Co.
Marcellus street (20 inch x 30 inch web tile)	1,827.00	John W. Bustin,

BOOKS AND PERIODICALS UPON MUNICIPAL TOPICS

Some of the Important Books of the Season—Valuable Work Upon Refuse Disposal

BOOK REVIEWS

AMONG the smaller hand-books which have been issued during the past five years upon various technical subjects, none has been more thoroughly prepared—judging from internal evidence—than *The Gas-Engine Hand-Book*, by E. W. Roberts, M. E. This is a manual that is well adapted to the needs of the student and the practical engineer, as well as the designer. 12mo, 241 pages. Illustrated. Price, $1.25, cloth; $1.50, flexible leather. The Gas Engine Publishing Company, Goodall Building, Cincinnati, O.

The current number of "Municipal Affairs," which should have been published in March, but did not see the light until June, is devoted to "*A Biography of Municipal Problems and City Conditions*," under the authorship of Robert C. Brooks, with Dr. Milo Roy Maltbie as a co-laborer. It forms a volume of 346 pages and represents an amount of work, literally stupendous in its proportons, which only those who are familiar with that kind of labor can fully apprehend. The volume sells for 50 cents in paper binding and $1 in cloth, but it is worth many times that amount to the person who is interested in the study of municipal affairs. As a book of reference it is an invaluable assistant to the student, or even the casually interested in municipal matters. It is the most complete bibliography upon the subject of municipal affairs that has even been published, and it is brought down to January 1, 1901. It contains a reference to every book, magazine or other article of any note which has been published upon the subject. Copies will be mailed to such as desire them on receipt of the price, postage prepaid. Address, Municipal Affairs, 52 William street, New York.

"*Municipal Accounting*" is the subject which has been formally treated in a monograph by F. H. McPherson, C. A., of Windsor, Ontario. It is a comprehensive treatise on the subject of municipal accounts, illustrated by specimens of improved forms of books and reports, including sinking fund and instalment or annuity tables, for terms of two to thirty years, at rates of interest from two to six per cent., besides having other labor saving tables. It is a volume which every one who has anything to do with municipal accounting should own and read. It is published by The Book-Keeper Publishing Company, Ltd., of Detroit, Mich., and can be purchased from that firm direct or from its author, who will state price upon application. It is octavo size and contains forty-six pages.

"*The International Year Book*," published by Dodd, Mead & Co., New York and Chicago, helps to solve the problem, how to keep up with the times, for the busy city official. It contains the events of 1900 in condensed form, and is supplied with a copious and well arranged index which permits of instant reference to the piece of information sought after. It has the returns of the new census, charts, diagrams, maps and graphic drawings showing the territorial changes of the year, together with comprehensive accounts of scientific progress and everything else that could be expected in a history of the time. Including the index it contains 1,061 pages, and is sold in the following bindings at the prices specified, for which it will be sent to any address carriage prepaid: Cloth, $3; Buckram, $3.50; Library leather, $4; Half-Morocco, $5; Full-Morocco, $8.

"*Brown's Directory of American Gas Companies*" is a directory of over 200 pages and contains invaluable information and statistics relating to the gas works of the United States. It has been thoroughly revised and corrected and brought down to January 1, 1901. City officials who desire to keep informed as to what different cities are paying for gas, both for fuel and illuminating purposes, will do well to obtain a copy of this directory. It is published by E. C. Brown, from the press of "Progressive Age," 280 Broadway, New York, where it can be purchased for $5.

"*Monopolies, Past and Present*," is an introductory volume to the broader and deeper study of the questions involved. It has been prepared with particular reference to the needs of the busy man It is an historical introduction to the study of monopolies vividly and tersely told, put in the fewest possible words so that "he who runs may read." For the convenience of those who wish to delve more exhaustively into the subject a list of the chief secondary sources of information is given at the beginning of each chapter. Mayors and other city officials who seek to familiarize themselves with the principles involved, as well as with some of the solutions of the problem which confronts them, will find in this volume an assistant of great value. The author is James Edward LeRossignol, Ph. D., of the University of Denver, Col., and it is published by Thomas Y. Crowell & Company, New York, and sold at $1.25.

City officials who wish to know about the failure of asphalt pavements in Buffalo, N. Y., can do so by sending five cents to James Malcolm, care "The Courier," Buffalo, N. Y., who will mail a copy of "*A Brief History of Asphalt Pavements in Buffalo*." It is a 24-page illustrated pamphlet, which shows up the subject in a most thorough manner.

THE ECONOMIC DISPOSAL OF TOWN'S REFUSE—By W. Francis Goodrich, A. I. M. E. 340 pages. 75 illustrations. P. S. King & Co., London; John Wiley & Sons, New York. $3.50, postage paid.

No question connected with municipal affairs is more puzzling than that of the disposal of the waste of the community; hence any book that offers help to enlighten the public upon this unsettled matter is of great value.

This book, written by an English engineer of wide experience in this line of work, brings into small compass the results of twenty-five years' study of the problem. In place of fragmentary papers and reports, we now have a clear and accurate description of methods and appliances that are in actual use.

Beginning with the first crude form of furnace, that which treated the waste by a slow process of cooking, and passed the gases thrown off direct to the chimney, the author notes the addition of the fume cremator that partially destroyed the noxious vapors; the introduction of a steam boiler in the flue of the chimney; and the use of power for a forced draught. Then the change in the form of destructors, bringing the boiler directly behind, or, in some cases, over the fire box, developing great steam power, abolishing the fume cremator, the whole uniting in small space what had before occupied much ground.

Refuse tipping, or dumping, as we term it, is strongly condemned, and quotations given from authorities all over the world against the filthy practice. One striking instance is given of 1,000 kilos of mixed matter, after remaining in place nine years, contained 266 parts of putrescible organic matter and 733 parts in cinders.

Sorting, or attempt at utilization of the valuable portion of the waste, is disapproved of, as unsanitary and objectionable. The author advises to "burn as much as possible," quoting from the report of the Chelsea Disposal Works, London, the largest plant for this purpose in the world. But with us in America there is another side to this matter.

The waste of American cities contains from 5 to 8 per cent. of paper rags and other materials too valuable to be lost. The people in the larger cities recognize this and assist by making a separation at the house. The city does its part by separately collecting this and delivering it to be sorted under sanitary conditions, and eventually nearly 50 per cent. is sent to the paper mills.

The chapter of Mr. Goodrich's book on steam-raising value of town's refuse is the one that is of more general interest than any other. While the production of power is the secondary function of a de-

structor, there is still an enormous force produced in every properly designed plant; a force which must be utilized in all future work. The author gives the following table of the component part of English refuse and the heating power of the combustible portions:

Composition of ashbin refuse.	Percentage of weight.	Calorific value of heat developed per pound of refuse. When dry.	When containing average percentage of moisture.
Breeze and cinder	50.0	6,000	4,000
Paper, straw, and fibrous matter	13.	3,000	2,534
Coal	.7	14,000	9,334
Coke	.3	12,000	8,000
Bones and offal	.6	8,000	5,334
Rags	.4	5,000	3,334
Ash	12.	.....	.....
Dust and dirt	20.	.....	.....
Bottles, tins, crockery, etc	3.	.....	.....
	100.0		

Applying these figures to the actual question of raising power, the average evaporative power obtained is stated:

	Weight of water evaporated at 212 degrees F. per pound of fuel.
Screened ash pit refuse, the best	2.00
Screened ash pit refuse, average	1.50
Unscreened ash pit refuse, best	1.25
Unscreened ash pit refuse, average	1.00
Unscreened ash pit refuse, inferior quality	.75
Unscreened ash pit refuse, two parts street sweepings	.75
Unscreened ash pit refuse, two parts, one part street sludge	.50
To this may be added the report of Sir Douglas Fox on the refuse and sludge destructor at Leighton. Ordinary house refuse, two parts by weight, sewage sludge, one part by weight, containing 64.86 per cent. moisture	.507

The residuum was 25 per cent. to 30 per cent. by weight of clinker and ash. From these figures the approximate steam power of any refuse at any place may be calculated and the actual value in horse-power arrived at. Engineers and others interested in this work will appreciate the labors of Mr. Goodrich in this direction.

Destructors that proceed by natural draught and slow combustion are compared with those employing forced draught and high temperatures, and the author states as a fact, "those destructors that deal with the largest quantities of waste per cell per day are those that give the best all around results."

Waste disposal in London is fully treated, showing the methods in thirty-nine parishes or districts; the establishment of destructor plants in fourteen of these; the sorting or utilization methods in four; and the remaining parishes barging to the sea or the country their waste. There are four large destructor plants now being erected in London, designed to produce electricity to aid in street lighting.

Great space is given to description of the disposal work in Great Britain; the methods in use in the larger cities are described; reports, tables and special information make these chapters of great value. The several types of destructors in use, their special advantages for different classes of work, their technical description, with cuts and illustrations, together with plans and specifications for boilers, chimneys, and other structural details, are given. A general statement of results might thus be stated. There are 112 places where destuctors are installed, thirty-one more where now building. The average cost for operating at thirty-three places is 23 cents per ton, and the average moisture 39 per cent. per ton, and average evaporation one pound of water for each pound of refuse destroyed.

Refuse disposal in America is given considerable space. It is preceded by a short introduction concisely stating the present situation, and advocating the investigation of the subject by American municipalities, upon scientific grounds, with a more liberal expenditure of money, and the selection of the methods which are proving the most efficient. A short history of the New York City conditions does not serve to enlighten us much, as the author was evidently not in possession of exact information. The difficulties of reporting disposal work in this country are insurmountable. There are no exact and accurate reports of work done by cities; no tests by trained experts; nothing upon which to base comparisons; only a loose, disjointed, incoherent, and misleading account that gives nothing of service.

The remarks of the author on the situation over here are true and pertinent, yet they do no more than outline the facts in the case. He reflects severely upon the "contract system," by which the cities place the disposal work in the control of individuals or companies for a term of years, and compares the results obtained by the municipal system in England with the practice in America, greatly to our disadvantage.

Did space and time permit much might be said in explanation, and something in defense of the present American practice; but in the main, the facts are as stated.

Forty pages are devoted to the description of American crematories and reduction plants; their construction and operation, accompanied by many illustrations, tables of analysis, quantities, etc. Here again the author is handicapped by lack of details. He includes several cremators that exist only on paper, and others abandoned after one unsuccessful experiment. These pages are a melancholy exhibit of our slow progress, compared with the elaborate equipment and far superior efficiency of the English destructors.

Several chapters are devoted to the disposal work of Europe, Africa, Australia, and the East, showing the widespread interest in the subject.

The book concludes with a slight account of the disposal of the waste of institutions, the description of motors—steam and electric—used in street cleaning work, the value of clinker and ash when manufactured, and the latest reports from the most efficient plants in England.

As a whole the work is the only complete and comprehensive one of its class. It is valuable not only for its account of what has been done, but also for the clear indications of what the future of disposal work will be. The admirable illustrations and tables of reference are special features of interest, and in general appearance and typography it is among the best. To us in America it comes as a revelation of a state of things of which we knew almost nothing. With the exception of a few engineers and sanitarians, none was aware of the magnitude of this work abroad and of its usefulness to municipalities. Its great value here is as a text-book for the information of city authorities, health officials, engineers, and those interested in the vital question which is now one of the uppermost problems in municipal affairs.

W. F. Morse.

AMERICAN PERIODICALS

Civil Service Reform. Two and one-half page article by Marion Couthony Smith in *Good Government,* June 15, 1901. Price, $1.00 per year; 10 cents per copy.

The Effect of Water Meters on Water Consumption in the Larger Cities of the United States. Paper by George I. Bailey in *The Journal of the New England Water Works Association,* June, 1901.

The Opposition to Municipal Socialism in England. Sixteen-page article by Henry J. Gibbons in *The Journal of Political Economy,* March, 1901. $3 a year; 75 cents a copy.

Street Railway Franchises in the City of Berlin. Article of eleven pages by Edmund J. James in *The Journal of Political Economy,* March, 1901. $3 a year; 75 cents a copy.

The Social Engineer. Sixteen pages by Dr. W. H. Tolman in *Cassier's Magazine* for June, 1901.

The Smoke from a Great City. Eight pages by Professor C. G. Benjamin in *Cassier's Magazine* for June, 1901.

The Antecendents of the Septic Tank. Leonard Metcalf, Assoc. M. Am. Soc. C. E. Paper to be presented September 18, 1901. *Proceedings, American Society of Civil Engineers,* May, 1901.

Water Pressure in Business Sections. Public Improvements, June. 1901. $3 per year; 25 cents a copy.

Metropolitan Water Works Pumping Machinery. Five-page paper by Will J. Sando in *The Journal of the New England Water Works Association,* June, 1901.

Municipal Activity in England. Twenty-page article by Elsie Watson in *Political Science Quarterly,* June, 1901. $3 a year; 75 cents a copy.

How a Southern City Abolished Mosquitoes. Hon. N. T. Barton, Mayor of Winchester, Va., in *The Independent,* July 18, 1901. Price, $2 a year; 10 cents a copy.

A Municipal Program. Report of a committee of the National Municipal League. A thirteen-page article by Horace E. Deeming. *Annals of the American Academy of Political and Social Science,* May, 1901. $1.00 per number; $6.00 per year.

RECENT INVENTIONS

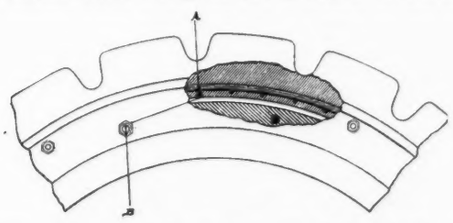
675,486—*Fireproof Construction and Hanger Therefor.* G. H. Kunneke.
675,522—*Trolley-Pole.* Chas. Nicholson, Springfield, Mass.
675,523—*Street-Car Fender.* Geo. A. Parmenter, Cambridgeport, Mass.
675,561—*Street-Sweeper.* Jesse M. Harr, Washington, D. C.
675,876—*Motor Passenger Vehicle.* James C. Anderson, Highland Park, Ill.
675,883—*Fountain.* Frederic W. Darlington, Philadelphia, Pa.
675,884—*Refuse-Burner.* Linton A. Dean, Rome, Ga.
675,888—*Elevator Safety Appliance.* James G. Gracey and Alfred Gfeller, St. Louis, Mo.
675,900—*Vehicle-Body.* Jas. N. McLean, Dayton, Ohio.
675,916—*Extension Car-Step.* Henry E. Youtsey, Louisville, Ky.
675,931—*Electric Meter.* Luigi E. G. Cauro, Naples, Italy.
675,977—*Side Bearing for Cars.* Winfield S. Rogers, Boston, Mass.
675,984—*Cash-Indicator.* Jacob H. Snow, Indianapolis, Ind.
676,019—*Air-Brake.* Andrew J. Wisner, Philadelphia, and John S. Ely, Bridgewater, Pa.
676,042—*Vehicle Hub.* Gaston C. Lewis, Bayard, Fla.
676,018—*Electric-Railway System.* George Westinghouse, Jr., Pittsburg, Pa.
676,116—*Steering Mechanism for Vehicles.* Frederic C. Billings, Hartford, Conn.
676,128—*Method of Surfacing Railroad Tracks.* William Goldie, Wilkinsburg, Ga.
676,167—*Device for Anchoring Car-Wheels to Their Tracks.* John C. Wands, St. Louis, Mo.
676,207—*Appliance for Stopping Railway Trains.* Sam. Steiner and Conrad Boltshausser-Schmid, Zurich, Switzerland.
676,223—*Automobile Vehicle.* Leonard H. Dyer, Washington, D. C.
676,253—*Tie-Lifter.* Floyd J. Hively, Cowen, W. Va.
676,280—*Electric Switch.* Eduard Schule, Barmen, Germany.
676,398—*Air-Brake Mechanism.* John F. Mallinckrodt and W. H. Sauvage, Denver, Col.
676,431—*Mail-Box.* C. O. Giere, Hayfield, Minn.
676,434—*Railway-Car Roof.* Eugene R. Hutchins, Chicago, Ill., and Samuel Herbert, Detroit, Mich.
676,456—*Vote-Recorder.* A. J. Bolfing, San Francisco, Cal.
676,526—*Hose or Pipe Nozzle.* Alfred Anderson, Chicago, Ill.
676,744—*Burglar-Alarm.* Orval J. Gatten, Columbus, O.
676,785—*Mould for Concrete Construction.* P. T. L. Toelpe, Neumünster, Germany.
676,803—*Building Block.* William E. Shaw, Chicago, Ill.
676,894—*Soft Tread Horseshoe.* Joseph C. Higgins, Boundbrook, N. J.
676,913—*Mail-Box.* Victor E. Randall, Burlington, Mich.
676,955—*Telephone System.* Frank A. Lundquist, Chicago, Ill.
676,961—*Fireman's Hook.* John C. Parks, Brockton, Mass.
676,968—*Hitching-Post.* Alexander A. Stanton, McCall, S. C.
677,041—*Fire-Escape.* William Nash, Towlesville, N. Y.
677,069—*Car-Fender.* Fred F. Dow, Fredericton, Canada.
677,125—*Prepayment Gas-Meter.* William E. Gibbs, Fanwood, N. J.
677,138—*Chemical Fire-Extinguisher.* John M. Marty, Cleveland, Ohio.
677,196—*Combined Door-Knob and Bell.* John W. Freeman, Denver, Col.
677,202—*Appliance for Scraping Sewers or Drains.* William H. Gibbs, Chatham, Eng.
677,293—*Convertible Open and Closed Car.* Henry Frost, Cohoes, N. Y.
677,329—*Mail-Box.* George W. Smith, Union City, Ind.
677,362—*Hydrant.* Christian E. Loetzer, Sayre, Pa.
677,376—*Turbine for Water Mains.* Moritz Scharfberg, Berlin, Germany.
677,388—*Sidewalk Cover.* John Wagner, Milwaukee, Wis.
677,420—*Fireproof Floor and Girder.* Edmond Molloy, Philadelphia, Pa.
677,423—*Mail Service System.* George A. Owen, Springfield, Mass.
677,523—*Car-Fender.* Samuel Lind, Davenport, Ia.
677,532—*Yielding Automatic Adjustable Car-Fender.* Scott W. Alexander, Los Angeles, Cal.
677,558—*Fluid Meter.* Horace Chrisman, Wilkinsberg, Pa.
677,668—*Process of Purifying Water.* Charles H. Koyl, New York, N. Y.
677,715—*Fire-Extinguisher.* George W. Thompson, Nashville, Tenn.
677,848—*Electric Railway.* Frank M. Ashley, New York, N. Y.
677,889—*Street-Railway Switch.* John Simmerman, Dayton, Ohio.
678,023—*Street-Car Fender.* Charles Nicholson, Brooklyn, N. Y.
678,074—*Mail-Carriage Wagon.* George A. Town, Framingham, Mass.
678,249—*Fire-Extinguisher.* George C. Hutchings, St. Louis, Mo.
678,277—*Machine for Removing Snow and Ice.* Chas. Poore, Western Springs, Ill.

WHAT OUR ADVERTISERS HAVE TO SAY

The People Who Make the Modern City Possible—They Tell Their Own Story—Information That Should Not Be Overlooked by the City Official

GOODYEAR'S NEWEST MOTOR TIRES

THE Goodyear Tire & Rubber Company, Akron, O., is furnishing endless solid tires for motor work, at present chiefly upon the large cabs run in New York, Boston and Philadelphia, of the design shown in the illustration herewith. These tires, it is said, have a general advantage over pneumatics of a longer life, requiring no repairs until worn out, being, of course, free from punctures, bursts, etc. The tire has an advantage over ordinary solids in that by vulcanizing the rubber to endless wires within the tire it retains all the strength of

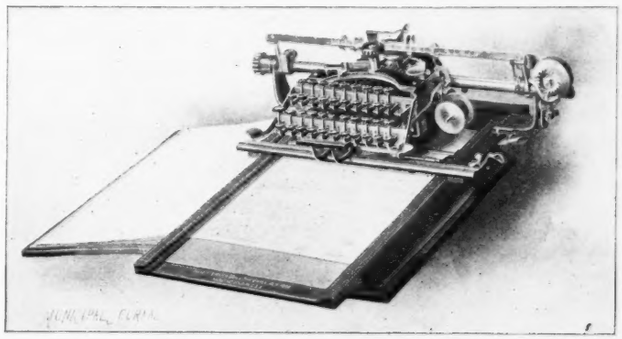


solid rubber and none of the weaknesses of tires having loose retaining bands within the rubber or in the sides of the rubber. Still further, the company combines with its solid tires, the patented Wing feature which prevents water and dirt from getting under the tire and also cutting and chaffing against the channel. This tire, the makers believe, is the most resilient on the market.

Similar in the endless wire construction to the solid tire are the transmission belts for motor vehicles and motor bicycles now being produced by the company for foreign consumption. By the use of this construction there is no possible stretching.

THE BOOK TYPEWRITER FOR CITY USE

THE substitution of the typewriter for the pen in correspondence and other work where loose sheets could be used was a comparatively easy victory, when compared with that achieved by the genius who invented the book typewriter. The difficulties which confronted the inventor when he undertook to construct a machine which would



ELLIOTT & HATCH BOOK TYPEWRITER

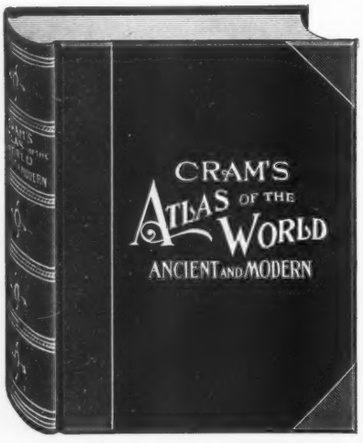
write with ease and rapidity in a cumbersome record book were, seemingly, insurmountable. But success crowned his efforts, and the evidence of his skill is shown in the operation of the effective book typewriter, which is manufactured by the Elliott & Hatch Book Typewriter Co., of 290 Broadway, New York.

For years this machine has been in use in many city offices, busi-

ness houses and railroad offices, giving perfect satisfaction. It is really wonderful how perfectly this machine can be adapted to the most difficult record work, in books or out, it makes no difference where. The most complicated tabular work, such as is found in railroad offices, is as easily turned out by this machine as the simplest kind of record work, and that is mere child's play. The construction of the machine, contrary to what might be supposed, is simple, and its operation is no more difficult than that of the ordinary typewriter. The indelibility of its record ribbons has been affirmed by the courts, and the compactness and legibility of records made with this machine afford such great satisfaction to those who have used the machine that they only have the warmest words of commendation.

The experience of City Clerk Clement B. Jones, of Jamestown, N. Y., will be interesting to members of the League of American Municipalities. He says: "I find it invaluable for writing the records of my office. This machine makes work not only more expeditious, and the writing compact, but makes records perfectly legible. It is a great space saver, both in books and vault room, as nearly double the amount can be put into a book with the machine that could be with the pen."

CRAM'S NEW CENSUS ATLAS



CRAM'S atlas needs no recommendation to our readers, as the older editions can be found in thousands of homes and offices, and it has always been the most satisfactory atlas published.

Mr. Cram has just completed his new atlas, which is the crowning achievement in the art of map-making of the nineteenth century. The maps have been newly engraved throughout and double the scale of all former editions.

Cram's atlas is not a mere book of maps. It is an encyclopedia, a complete gazeteer, as far as the world is concerned, a work of curious and instructive diagrams giving life and meaning to social and economical statistics which by themselves the mind refuses to grasp.

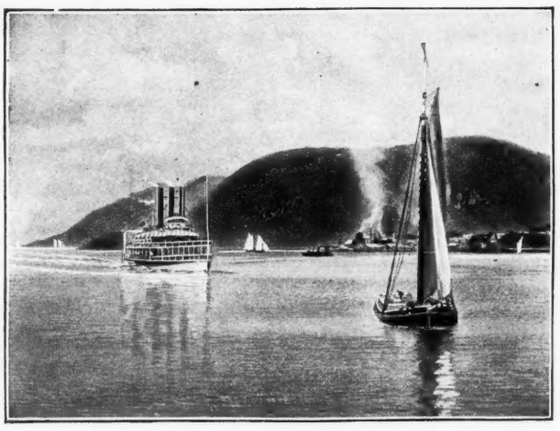
It has so many interesting features and it has been so well and thoroughly done that, when once examined, it commends itself to all intelligent and thoughtful people. This new work ought to have a place in every home and library, not only as an educator, but as the means of spending many a pleasant and profitable hour in looking over and studying its interesting features. An education is the basis of success.

The price will be advanced after the present edition is exhausted. Address all inquries for the price, terms, etc., to Geo. F. Cram, 130 Fulton street, or 61 Plymouth Place, Chicago.

THE PICTURESQUE HUDSON RIVER

AT this season of the year many of the readers of the MUNICIPAL JOURNAL AND ENGINEER are on pleasure bent, with eyes fixed, perhaps, on the Pan-American. Just for a "pointer," attention is called to the beautiful ride from New York to Albany on the picturesque Hudson river, via the Day line. It is, without question, the most charming inland water trip on the American continent. All the way from New York to Albany, there stretches out, on either side, not only scenic beauty unsurpassed, but every foot of ground almost is associated with some interesting event in the history or romance of this delightful region.

This line of steamers, which is fitted with every convenience calculated to minister to the comfort and pleasure of the passengers, makes its last trip from New York on October 26 and from Albany



MOUNT TAURUS, COLD SPRING

on the 28th. The steamers do not run on Sundays. Round trip tickets are good to return at any time during the season in which they are issued. Coupon ticket agents of all railroads in the United States and Canada sell tickets to all important points on, or reached, via the Day line steamers. Full particulars can be had from Mr. F. B. Hibbard, general passenger agent, Desbrosses street pier, New York.

THE SHANGHAI, CHINA, EXCHANGE

WHILE China is one of the largest countries of the world in point of area and population, it is backward in many respects in adopting the improvements of modern times. With few railway and telegraph lines, it has fewer telephone lines or exchanges.

By courtesy of the Ericsson Telephone Company, 296 Broadway, New York City, we illustrate the first sections of a telephone switchboard installed at Shanghai, China, recently placed in operation.

THE SHANGHAI TELEPHONE EXCHANGE

This is a full multiple board made by L. M. Ericsson & Co., Stockholm, Sweden, and the ultimate capacity is 5,000 subscribers. Our readers will observe that while the "chief" is a lady operator, and was imported from Sweden with the switchboard, the others are all natives. It is said that they are remarkably apt in learning to operate, quick in their movements and naturally patient and persistent, and they readily become expert operators. With a good knowledge

of the English language and an "open door" to enter the United States, it might be imagined that in this line the so-called "Heathen Chinee" would not be slow in occupying the field to a large extent, just as has been done by them in the hand laundry business.

MODERN AND ARTISTIC BRIDGE STRUCTURES

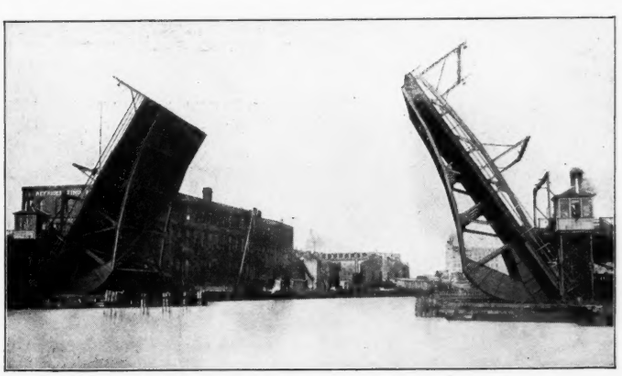
In removing the obstructions to navigation and the flow of water through the Chicago River, the trustees of the Sanitary District, who have this problem in charge, are pushing their work vigorously and as rapidly as the many obstacles to be overcome will permit. The

SCHERZER BRIDGE ACROSS CHICAGO RIVER—CLOSED

first and probably the most important part of the work consists in the ultimate removal of the center-pier swing bridges, which will be replaced by Scherzer rolling lift bridges, similar to the one recently completed at Taylor street. Contracts have already been awarded, and the work has commenced upon several new Scherzer bridges.

The new bridges will give an unobstructed channel of 140 feet in width, or wide enough to pass side by side two of the largest lake or ocean vessels likely to enter the harbor of Chicago for many years to come. The wide channels provided will enable vessels to pass these bridges very rapidly, and time will also be saved, as all the bridges are designed to be operated by electricity and can be opened or closed within thirty seconds.

After all the swing bridges have been removed and replaced by the more modern type of bascule bridge, and the obstructive tunnels have been lowered or removed, the largest lake vessels can readily and rapidly reach any point along the fifty-six miles of dock frontage comprising the present internal harbor of Chicago, and the delays heretofore caused by the slow passage of the vessels through the narrow openings provided by the swing bridges will be obviated. The highway traffic will also be greatly facilitated, as the present comparatively small and frequent vessels will be replaced by larger



SCHERZER BRIDGE ACROSS CHICAGO RIVER—OPEN

vessels, less frequent, but carrying a larger tonnage. The large, comprehensive plan under which the harbor improvements at Chicago are now being executed so vigorously indicates that Chicago will not only retain all of its present large marine commerce, but that it will also be prepared for the larger vessels and great increase of marine commerce certain to follow the completion of an adequate ship waterway within the United States, either to the Gulf of Mexico or to the Atlantic Ocean.

At Cleveland, Boston and other ports, swing bridges have been and are being removed and replaced by bascule bridges, and the demand for Scherzer rolling lift bridges has also extended to Russia and Japan, where the superiority of the modern rolling lift bridge finds ready recognition.

THE DORAN LIGHT

The accompanying illustrations are of the latest improved hydro-carbon lighting system, manufactured by the Acorn Brass Works of Chicago. The correctness of principle and simplicity of construction shown in these lights has been commended by light experts, who have pronounced it the "maximum of results with minimum of effort and cost."

The peculiar points of excellence of the Doran Light is its uniform brilliancy and comparative steadiness, as compared with other lights, and especially in comparison with the electric arc. The simplicity of construction is such that any one with the least mechanical knowledge can operate it. In view of the fact that the manufacturers are sending systems to nearly every country under the sun, and that they are placed in operation by the purchaser from printed instructions with unvarying success, amply proves the efficiency and simplicity of the system. From the fact that each street light is a unit in itself, it possesses a great advantage over the electric arc in severe weather, as it is impossible for more than a few lights to be affected at a time; whereas with the arc light a break in the wire will throw an entire town, or a large section of it, into darkness.

For interior lighting its efficiency is demonstrated by the thousands in use, and its economy is such as to practically make it possible to claim the same efficiency as that of the electric arc, with less cost and attendance than is necessary for an old-fashioned kerosene lamp, while its uses are as numerous as those of the electric arc. It is adapted to street lighting in cities, towns and villages; the lighting of stores, halls and churches, express offices, factories, mills, piers, railroad stations, freight houses, and other places where great illumination is needed. Several of the large railroads are now trying the lights with a view to their general adoption.

The manufacturers solicit correspondence with municipal authorities and others interested in good light, which will cost less to operate and install than any other light of equal candle-power in the market.

THE EMPIRE KITCHEN

A car kitchen is a new experiment which is being made by the New York Central on its famous Empire State Express. The speed of this train is so great that it is not deemed practicable to add the weight of a dining car to the train, and the furnishing of the meals to the passengers has heretofore been a serious question. It was originally decided to try the experiment of taking a portion of one of the long coaches with which this train is equipped and put in a small kitchen similar to those used in the regular dining cars. Movable tables enable two persons to enjoy a meal without disturbing anyone else in the car. In the kitchen, which is furnished with regular charcoal burners, the chef can broil steaks, chops or birds for ten persons at once, so that a large number may be served in a very short space of time.

One of these kitchens has been in use on the Empire State Express for some time, and it has proven a great success, the passengers being delighted with the service, as those who are not eating are not inconvenienced, and those desiring a meal are able to get it as hot and as well served as it would be in a hotel. The Empire kitchen may, therefore, be counted as another of the facilities afforded by the New York Central for the comfort of its patrons. In no other country on the globe is so much care taken to meet every want of the traveler as in the United States, and in no other section of the United States is the traveler better cared for than in the Empire State of New York.—Buffalo News.

A PRACTICAL FIRE EXTINGUISHER

WHENEVER an article of merit appears upon the market, and is a success from the start, a dozen or more imitators thrust themselves upon the unsuspecting public. Then a general appeal goes out in favor of this or that article.

The Diggs Fire Extinguisher stands on merit only. When seen, Mr. D. W. Diggs, 141 Centre street, said:

"It is a large statement, and I do not expect anyone to believe it on my word alone, but to those interested, I can say that the Diggs Upright Fire Extinguisher beats the world. An examination of this machine will convince any man; an investigation is all I want. 'The proof of the pudding is in the eating of it,' and, therefore, a practical demonstration of a fire extinguisher under pressure is the best test of its efficiency, which we will be pleased to give at any time."

Mr. Diggs has just issued a new catalogue giving full particulars, etc., of the different kinds of extinguishers, all about the Diggs patent automatic action, and several letters recently received from manufacturers, supply men, fire chiefs, etc., showing, in many cases, where thousands of dollars' worth of property has been saved by the use of the Diggs.

This company has also perfected a fire escape which they call the "Columbia." This has many new features.

A POPULAR ENCLOSED ARC LAMP

THE accompanying illustration shows one of the Constant Direct Current Series Enclosed Arc Lamps, manufactured by the Adams-Bagnall Electric Co., Cleveland, O. This lamp is gaining a well-deserved popularity with municipal and other electricians all over the country. About a year ago 1,600 of them were installed in the city of Pittsburg, as an experiment, and recently 1,600 more were installed in the same city because the trial of the others was so satisfactory.

This lamp is a model of simplicity of design and excellence of construction, fulfilling every requirement for modern arc lighting. It has a weatherproof case, a proper operation, a mechanism of the differential type, a perfect cut-out, a reliable clutch, no faulty sliding contacts, a durable carbon-holder; in fact the lamp is up-to-date and all that could be desired in every particular.

For many years, after the advent of commercial arc lighting, the manufacturing companies, while exercising any amount of skill in the perfection of generating apparatus, seemed strangely oblivious to the shortcomings of arc lamps. The creation of this lamp has solved the perplexing problem. Full particulars and prices can be had on application to the address given above.

THE POPULARITY OF MACHINE VOTING

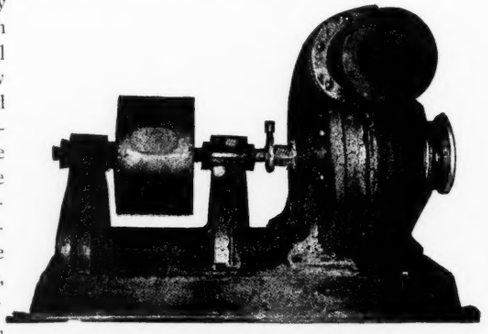
THE growing popularity of machine voting is one of the favorable signs of the times. The fact that 521 voting machines of the United States Standard type alone are now in use by various municipalities in the Empire State is most encouraging for good government. It is a fact worthy of mention that in all the recent elections where these machines were used they prevented absolutely the crooked work of the "political machine," which gets in its work at every election where the voting machine is not used. For this reason, if for no other, the general public should be in favor of using the voting machine. The "peanut" politician will argue to the contrary, because he knows that wherever the voting machine is installed it will be impossible for him to stuff the ballot box or tamper with the returns. This feature alone is of inestimable value, and is the greatest purifier of the ballot ever known.

The construction of the machine is simple and its operation, even by the illiterate, is far easier than the blanket ballot of the Australian system. In Buffalo, where the per cent. of ignorant and foreign population is very great, the machine has been operated at three successive elections, and with greater rapidity than ever before, without experiencing any trouble with even the most ignorant—all using the machine with apparent ease. When the machine was first used in Buffalo, the *Commercial* said, editorially, of the result:

"The *Commercial* admits that it was not at first inclined to look with favor upon the introduction of voting machines in this city. We were in doubt as to whether the experiment had been sufficiently tried. But, after yesterday's experience, the *Commercial* takes pleasure in saying that it now believes the purchase of the machines was one of the best investments the city ever made. The method of voting is distinctly preferable to the former ballot system. It takes less time, and the great amount of 'splitting' shown by the returns proves that the manipulation of the machine, as desired, was an easy matter to the voters."

Full particulars, together with illustrated descriptive matter, will be sent to any address, on application to the United States Standard Voting Machine Company, 1012 Wilder Building, Rochester, N. Y.

THE USE OF CENTRIFUGAL PUMPS



THE many ways in which centrifugal pumps are now employed, and the increased demand for the best, has been the incentive to improve their construction to the highest degree, including economy of operation, greatest results and durability.

Probably one of the most popular and widely known of these pumps is "The Bush," of which Mr. Jesse Craft, 260 Front street, New York, is the sole manufacturer and proprietor, who is an expert in this line of business, having devoted twenty years in experimenting with and testing centrifugal pumps.

It would be almost impossible to execute a large contract for public work without the assistance of a good centrifugal pump. The Craft pump is now used by the largest contracting companies in this country and South America for dredging, reclamation, drainage, sewerage, irrigation, wrecking, etc.

The modern plan of dredging and reclamation of land, by the use of centrifugal pumps, is becoming more thoroughly understood and generally adopted, especially where the dredged material is used for reclaiming adjacent land. This method is now in general use throughout the country, many of the outfits in operation having been equipped by Mr. Jesse Craft. By the use of his pumps many changes have been made in shore property, and hundreds of acres of what was formerly worthless land has been made into valuable property and the water-way deepened.

This process was employed at Manhattan Beach. By the use of the Craft improved dredge pumps, the material, sand and mud was pumped from Sheepshead Bay, through a line pipe—at times 2,000 feet in length—and delivered on the shore, and to-day this reclaimed land around the Manhattan and Oriental Hotels presents a far more pleasant view than when the former meadows and mud were prominent. A similar outfit has recently been shipped by Mr. Craft for use on the Gulf Quarantine Station, at Bolixi, Miss. The canal at Freeport, Long Island, was constructed by the same process.

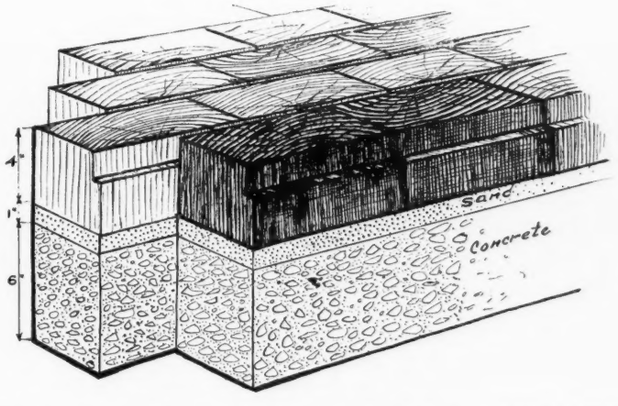
The drainage pumps have a broad field, and are in use by most of the prominent contractors in the United States, having been employed on the principal work for the past twenty years, including the Harlem Ship Canal, the extension of the Brooklyn water works, the Croton aqueduct, the foundation work on the Brooklyn Bridge, the foundation work of the New York Court House, the new power house of the Brooklyn City Railroad, and the large sewers in Brooklyn.

The Merritt & Chapman Derrick & Wrecking Company, who have used these pumps for years, found them invaluable in their operations on the wrecks of the late Spanish war vessels.

The gold fields of Bolivia, the Klondike and Cape Nome have been supplied with these pumping outfits; also, the clay pits and brick yards throughout the State of New Jersey and elsewhere.

WOODEN PAVEMENT ON GRADES

We illustrate herewith an improved form of wooden paving block, which is now being manufactured by the United States Wood Preserving Company, 29 Broadway, New York City, for use on a grade on Boylston street in Boston. This company has under contract sections of Boylston, Beacon, and Newbury streets, in Boston, as well as Harvard Bridge, connecting Boston with Cambridge; but on this particular section of Boylston street it was thought that, owing to the grade, a joint should be provided between the blocks to give horses a better foothold. The practice in London and Continental cities is to lay the blocks one quarter of an inch apart, thereby providing a joint from the top to the bottom of the block; but the United States Wood Preserving Company has improved on this method by grooving the



GROVED CREO-RESINATE, WOODEN BLOCK, FOR BOYLSTON STREET, BOSTON

block for a depth of one and one half inches, giving a quarter inch space between the edges, and allowing the blocks to butt solidly against each other for the remainder of their depth, as will be seen from the cut.

These blocks are treated with twenty-two pounds of creo-resinate mixture to the cubic foot, being creosote in combination with melted rosin and formaldehyde, the rosin being used to close the pores and render the wood not only impervious to water, but much harder and more durable.

Wooden blocks treated by the creo-resinate process have been laid on sections of Tremont street, Boston, for nearly a year, and are giving excellent service, showing no wear and giving a good foothold for horses, as well as making a noiseless and sanitary pavement.

MODERN MUNICIPAL APPLIANCES

The largest and most important group of corporations in the United States to day is that represented by the League of American Municipalities.

This is strikingly illustrated by the fact that according to the census of 1890, the receipts of the cities and towns of the country aggregated that year five hundred and twelve millions of dollars, or one hundred and nine millions more than the receipts of the Federal Government for the same period.

Not only is this volume of business of enormous money value, but it is, as well, of transcendent importance, by reason of its intimate relation to the lives and welfare of the large proportion of the people which constitutes our urban population.

It is but natural, therefore, that in the transaction of the business there should be an interesting demand for modern methods and appliances.

In the matter of United States Mail Service, public officials are coming more and more to feel that in the dispatch of public affairs they need the same postal facilities as are now universally available to the private individual doing business in a modern office or loft building or dwelling in a first-class hotel or apartment.

There has been, accordingly, for some time past, an increasing demand for the introduction of the United States Mail Chute or Cutler Patent Mailing System in such buildings, thus making it possible for mail to be dispatched immediately from any floor upon which it may originate without delay or the intervention of a messenger, other than the United States letter carrier.

To meet the requirements of this issue, it has been provided under special Act of Congress that the system is an official adjunct of the postal service, and, therefore, legal notices or official papers servable by mail may be lawfully "mailed" by deposit therein.

The apparatus is readily installed in completed buildings, though, of course, with more economy while a building is erecting.

It is being supplied to public buildings all over the country in connection with the United States free collecting service by the sole makers and patentees, the Cutler Manufacturing Co., of Rochester, N. Y., who are glad to give full information as to requirements of location, cost, etc., upon application.

They have the requisite facilities, experience and taste to execute, when desired, the very highest class of ornamental work conforming to the interior finish of a fine building, as is well shown by our illustration of the Special Bronze Mail Boxes, seven of which were set up by them in connection with the Cutler Mailing System in the Philadelphia City Hall, so interestingly described in the last issue of the Municipal Journal and Engineer.

AMERICAN ASPHALT ROCK

It has become known to a few people that in central west Kentucky there are large deposits of asphalt rock, about ninety deposits having been located. The area of each deposit varies in size from a few acres to several hundred. They are found principally in Edmondson and Grayson counties, with a few in adjoining counties. This section has crossing it the Illinois Central Railroad, affording transportation advantages; also it is intersected by Green river, which has been rendered navigable by lock and dams erected and maintained by the general government. For this reason it can be produced at a low rate. The quality of the asphalt is extremely good, with entire absence of organic impurities, the asphaltum averaging about 12 per cent. of the weight of the crude rock.

If the claims of the projectors are fulfilled, the production from these deposits will materially affect the status of one of the greatest industries of the nation. The most enduring roadways on earth

have been made of sandstone asphalt rock. By reason of the superior excellence of asphalt rock for pavements, attempts were made a few decades ago to import from Europe asphalt rock and make therewith the wearing surface for streets in American cities, but the cost was found to be so great that the business had to be abandoned. The Kentucky deposits will make it possible to greatly reduce the price of asphalt pavements. Rock asphalt, unlike the pitch lake asphalts, can be remelted and used over again and again, which is an advantage often overlooked.

The industrial enterprise which has taken up the development of the business of paving American cities with American asphalt rock appears to be in the hands of able men, backed by ample capital. The organization is equipped for effective operations on an extensive scale, and works having a large daily output of immense tonnage are being undertaken. Claims of superiority of quality of pavements and lower original cost, with no maintenance charges and other advantages, are made as follows:

First—Water and rail transportation from the mines to all of the central States give a great advantage in freights, lessening the cost to the municipality or other users.

Second—Pavements made of sandstone asphalt rock are smooth and resilient, but not slippery or soft. The sanded surface always keeps a grit to hold the horse shoe and the solid rocky firmness never becomes soft and spongy. It is unlike artificial mixed asphalt surfaces in these regards, for with the artificial, the surface is made glassy with the limestone and soft with the oils.

Third—As to the lasting qualities the advocates of asphalt rock pavements claim a vast advantage because of the permanent character of the rock which has been prepared by nature. It has never changed, and cannot from its very nature when spread, as the wearing surface of streets. Artificial mixtures change continually in their constituency from the time they are put down until they have run their career.

The reader's attention is called to the subject, for the reason that herein may be found the long sought solution of the great problem of an ideal pavement for American cities. The cost must be reasonable, the pavement must be sanitary and there must be enduring qualities that will obviate the enormous repair charges which have burdened the cities having asphalt streets. If the new industry can supply such pavements in extensive quantities at low cost, it has from its unique location and the impossibility of duplication, the opportunity of becoming one of our nation's great benefactors.

TRADE NOTES

—Havelock, Neb., has installed a public lighting plant which gives excellent satisfaction. It was put in by the Western Acetylene Company, of Lincoln, Neb., the Davis Acetylene Gas Generator being used. A letter addressed to the Mayor will bring full particulars about the economical working of the plant, or to the company at Lincoln.

—The incandescent burner and mantle for the use of acetylene is being rapidly developed and is obtaining striking results. It appears to increase the luminosity of acetylene in about the same ratio that is secured by the use of the incandescent mantle with ordinary gas. The Davis Acetylene Company, 46 South Clinton street, Chicago, will tell all about it.

—The Wainwright Steel-bound Concrete Curb and the combined steel-bound curb and gutter is one of the modern improvements which the up-to-date city cannot afford to be without, for it gives a finished effect to a street which cannot be obtained with no curb or one of the old type. It is cheaper than granite and absolutely nonbreakable. Steel Protected Concrete Company, Real Estate Trust Building, Philadelphia, Pa., or 145 La Salle street, Chicago.

—The Ogden Liquid Door Check and Spring, when applied to the doors of city, public or other buildings, is a servant who works with unceasing fidelity, never goes on a strike, does not have to be watched, is on duty seven days in the week, and does not have a salary. This is one of the public servants that saves the public property from being destroyed. The door cannot slam when "The Ogden is attached. Address the Ogden Manufacturing Company, Newark, N. J.

—In the extension of the water works system of Washington, D. C., some obstacles are met with which can be overcome in no other way than by the use of the Bacon Air Lift Pump. The Bacon Air Lift Company, of 100 Broadway, New York, is now constructing a plant, which involves a special application of the principle, for use in the city of Washington, for the United States Government. It will accomplish results that could be obtained in no other way. Full particulars concerning the adaptation of this pump to various classes of work in connection with similar problems will be sent on application to the above address.

—The Sprague Electric Company reports large sales of the Lundell fans this season. There has always been a great demand for these fans and their popularity is due to several superior features of design and construction. Light and power companies will be glad to learn that the Lundell motors and split-pole generators are now being made in sizes up to 1,000 H. P. and 1,000 K. W. respectively. Both classes of apparatus are in greater demand than ever. The Sprague company is also doing a rushing business with the Greenfield interior conduits and cables, the sales being unusually large.

TRADE PUBLICATIONS

"Scherzer Rolling Lift Bridges" is the title of by far the largest and one of the most beautiful catalogues ever received by The Municipal Journal. It measures eleven by fourteen inches and contains sixty-eight printed pages, which tell all about the evolution of the roller lift bridge, commencing as far back as the mediæval pivot or trunion bascule bridge. The advantages of moveable bridges are plainly stated, particularly of this type of bridge. These pages are illuminated with numerous half-tones and diagrams, and the subject is treated in a masterly manner. Following the text, twenty-three full-page plates show many of the Scherzer lift bridges which have already been constructed in different cities. Altogether it is a work of art. It is the special complimentary edition of the catalogue sent out with the compliments of Mr. Albert H. Scherzer, president of the Scherzer Rolling Lift Bridge Company, of Chicago, Ill.

"The Ogden" is the name of a small catalogue, containing twenty pages, exclusive of the cover, which fully explains the uses and advantages of the Ogden liquid door check and spring, how it can be applied to city and other public buildings. It is issued by the Ogden Manufacturing Company, Newark, N. J.

"Rex Is King" is a catalogue issued by the Rex Fire Extinguisher Company, 145 Centre street, New York, which tells all about the Rex fire extinguisher; how to use it; where it is used; by whom it is used, and with what marvellous success it has met in extinguishing fires in all sorts of places.

"Cement Coating" is the title of a booklet issued by the Chicago Cement Coating Company, 1641 Monadnock Block, Chicago, Ill., which shows, by text and illustrations, that cement coating is an effective and permanent waterproofing for brick, stone, cement and concrete work. One of these catalogues can be had for the asking.

"Studebaker Bros. Manufacturing Company Souvenir Twentieth Century Catalog" has just been issued by this well-known company. It is highly artistic in design and shows a few engravings of strictly *a la mode* work for the "smart set." By address, g the company at South Bend, Ind., you can have one for examination.

"The Best Light" is the title of a neat little 48-page catalogue, issued by The Best Street Light Company, Canton, O., and tells all about the "Best" incandescent vapor gas lamp. One remarkable statement must attract attention, viz., that a room, twenty by sixty feet can be lighted for 100 hours per month, for one year, at an expense of $3.60.

"Concrete Fireproofing" is a pamphlet, printed in three colors, profusely illustrated, telling both in its text and illustration, how successfully fireproofing has been used in numberless buildings in many American cities. The system employed by the Columbian Fireproofing Company, Pittsburg, Pa., is shown up to great advantage. A copy of this booklet can be secured on application to the Columbian company at the above address.